Age
1929

The RUBBER AGE

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LATE NEWS of the Industry

Tire Output Dropped 3.3 Per Cent To 76,000,000 Units During 1929

FIGURES available to date indicate that production of pneumatic, solid and cushion tires in the United States during 1929 reached a total of approximately 76,000,000, a decline of 3.3 per cent from the 1928 total of 78,622,448. Output of inner tubes of all types during the year was only 75,000,000 as against the 1928 figure of 80,179,841, a drop of more than 6 per cent.

During 1929, tire production appeared to be divided into 75,450,000 pneumatic casings and 550,000 solid and cushion tires, representing a decline for both classes. In 1928, the actual output was 77,943,817 pneumatic casings and 678,631 solid and cushion tires.

The latest Rubber Manufacturers Association figures show a production in October of 4,918,912 pneumatic casings, 5,309,711 inner tubes and 46,101 solid and cushion tires. For the first ten months of 1929, actual production was 66,443,037 pneumatic tires, 65,896,602 inner tubes and 467,186 solid and cushion tires.

Total shipments during October are estimated at 4,959,676 for pneumatic casings, 5,001,437 for inner tubes and 47,725 for solid and cushion tires. Inventories as of October 31 are estimated as 12,844,538 for all pneumatic casings, 13,655,866 for inner tubes and 147,832 for solid and cushion tires.

The tire industry is estimated to have consumed a total of 55,699,924 pounds of crude rubber and 18,275,557 pounds of cotton fabric during the month of October in the manufacture of all types of tires and tubes. The association's figures are based on reports furnished by manufacturers who produce approximately 75 per cent of the total for the United States.

New Investment Trust Discloses Large Rubber Company Holdings

WHEN Continental Shares, Inc., a new $130,000,000 investment trust, was admitted to listing on the New York Stock Exchange this month, a statement of its portfolio showed that more than 10 per cent of its holdings were in the "Big Four" rubber manufacturing companies. In view of its declaration at the same time that mergers would form an important part of its policy, this accumulation of rubber shares is regarded as likely to have a far reaching effect on the industry in the future.

"While corporation places some of its funds in stocks purely for an investment," its listing application states, "its chief purpose is to acquire substantial holdings, either alone or in conjunction with affiliated interests, in prominent companies in such basic industries as steel, rubber and public utilities. These larger investments are held with a view to promoting more effective operation and more efficient management by means of co-operation among, or mergers or reorganization of, the companies concerned. Having such ends in view, the corporation looks to the carrying out of its plans for ultimate profit, rather than to current market quotations."

This statement by Continental Shares is the first admission from that source that the purchase of rubber shares by members of the Otis-Eaton group was for other than investment purposes. Continental Shares is one of a group of three companies sponsored by the Otis-Eaton interests of Cleveland whose policies are, to a certain extent, coordinated along these lines in association with the banking house of Otis & Company. The other two companies are Commonwealth Securities, Inc., and International Share Corporation.

The company's investment in the rubber business, while broader than generally appreciated, is confined to the four leading companies, the Goodyear Tire & Rubber Company, the United States Rubber Company, the Firestone Tire & Rubber Company and the B. F. Goodrich Company. In addition, the company owns 277 of the 1,000 outstanding shares of Goodyear Shares, Inc., a holding company formed last December by the Otis-Eaton interests for their Goodyear common stock. The combined holdings of Goodyear Tire & Rubber common in Continental's portfolio and in Goodyear Shares, Inc., are 285,105 shares, or 25.81 per cent of the rubber company's outstanding common stock.

Future activities of the Otis-Eaton group must be based on the holdings of the three investment companies and of the banking house. It is believed that disclosure of the holdings of the various members of the group in these four rubber companies would probably show a substantial position in more than Goodyear Tire & Rubber alone. As for the actual ownership by Continental Shares, no very influential positions are shown, as the following table, as of November 30, indicates:

	Common shares outstanding	*Held by Cont. Shares*	*Per Cent of Total*	*Market Valuation*
Goodyear	1,398,126	75,800	5.42	$5,040,700
U. S. Rubber	1,545,959	35,000	2.26	923,125
Firestone	2,250,000	107,800	4.79	3,880,800
Goodrich	1,053,395	40,100	3.80	1,814,525
Goodyear Shares	1,000	277	27.70	2,186,915
Total rubber share investment				$13,846,165

Rubber Company Federal Tax Refunds Amount to Nearly $2,000,000 in 1929

THE United States Treasury, according to an announcement made public on December 27, has refunded to rubber manufacturing companies and to suppliers to the rubber industry a total of nearly $2,000,000 in the last fiscal year for claims of excess income taxes paid. To all companies and individuals throughout the United States, the government has paid back a grand total of $190,164,359.

A refund of federal taxes of $949,507 to the Kelly-Springfield Tire Company, New York City, appears as the largest single rubber company item among the thousands on the list sent to Congress by Andrew W. Mellon, Secretary of the Treasury, in compliance with a provision of the present tax law. The second largest refund to a rubber company, amounting to $226,687, was returned to the Goodyear Tire & Rubber Company, while the sum of $209,347 was paid back to the Fisk Rubber Company. The Hood Rubber Company, now a subsidiary of the B. F. Goodrich Company, received a refund of $110,934. In all, these four tire and rubber manufacturers alone were paid back practically $1,500,000.

In addition to the amount returned to it last year, the Goodyear Tire & Rubber Company is at present suing the government to recover the sum of $1,472,436, alleged to have been collected in income and excess profit taxes in 1917, 1918 and 1919 above the amount actually due.

A list of the income tax refunds paid to some of the more important rubber manufacturing companies, crude rubber dealers, reclaimers, rubber machinery manufacturers, and chemical houses follows:

American Rubber & Tire Company	$ 5,991
Baird Rubber & Trading Company	2,150
Bloomingdale Rubber Company	675
Columbian Carbon Company	55,046
DeMattia Brothers Foundry & Machine Co.	655
Easthampton Rubber Thread Company	6,170
Endicott-Johnson Corporation	49,864
Everlastik, Inc.	528
Farrel Foundry & Machine Company	19,043
Fisk Rubber Company	209,347
Goodyear Tire & Rubber Company	226,687
Grasselli Chemical Company	34,601
Hohman Rubber Company	605
Hood Rubber Company	110,934
Jenckes Spinning Company (Manville-Jenckes Company)	144,035
Kelly-Springfield Tire Company	949,507
Littlejohn & Company, Inc. (care of W. Parsons)	3,177
Moco Company of America (care of Monkey Grip Rubber Company)	14,798
Fred E. Pusinelli	22,401
Raybestos Company	12,937
Schaeffer & Budenberg (care of Alien Property Custodian)	149,732
A. G. Spalding & Brothers	8,296
Joseph Stokes Rubber Company	1,243
Thermoid Rubber Company	14,578
United States Rubber Company	38,219
Whitehead Brothers Rubber Company	509

Samson Tire & Rubber Company Will Sell $800,000 New Preferred Stock

THE stockholders of the Samson Tire & Rubber Company on December 26 approved a proposal to increase the authorized preferred stock to 100,000 shares of $10 par value from the present 20,000 7 per cent cumulative shares. The present preferred stock is nonconvertible, but the additional 80,000 will be convertible at the option of the holder on a basis of one share of common for two shares of the new preferred.

The present preferred shares are redeemable at $10.50 a share and accrued dividends. The additional preferred will be sold to provide funds for expansion, and it is understood that a banking group has agreed to take the entire issue.

The Samson Tire & Rubber Company, established in 1917, has risen to become the largest independent tire manufacturer in the West and to be a strong rival to the branch organizations of Akron tire companies located in Los Angeles. Last year it completed a new $8,000,000 factory in that city, built in massive Babylonian style, and capable of producing 6,000 tires and 10,000 tubes daily. Its old San Diego plant has been dismantled, and its Compton factory is gradually being closed down.

Net earnings of the company have risen from $424,716 in the year 1927 and $225,425 in the 11 months ended November 30, 1928, to a figure estimated at over $500,000 in the year ended November 30, 1929. Sales have also risen steadily from $6,588,075 for the year of 1927 to $7,605,410 for the 11 months ended November 30, 1928, and totaled $5,257,792 for the seven months ended July 31, 1929.

The Samson company now makes sales through a list of more than 1,200 dealers throughout the United States and has firm contracts with several of the largest national consumers, including Montgomery Ward & Company and Sears, Roebuck & Company. As early as last summer it was stated that distribution for the company's entire 1929 output was assured and was limited only by plant capacity.

Du Pont Interests Form New Trust To Hold U. S. Rubber Company Stock

THE Rubber Securities Corporation, a $20,400,000 investment trust, has been formed by the du Pont interests to hold United States Rubber Company common and preferred shares owned by the du Pont family, their friends and associates, it was learned a few days ago. The control of the United States Rubber Company, largest producer of crude rubber and second largest manufacturer of rubber products, was considered to have been obtained by the du Pont interests last year, following which F. B. Davis, Jr., former president of the du Pont Viscoloid Company, was elected president and chairman of the board of directors.

The Rubber Securities Corporation, granted a charter on December 6 in Delaware, will have a capitalization of 200,000 common shares of $100 par value and 8,000 preferred shares of $50 par value. The United States Rubber Company stock to be turned over to the new company was formerly held by a syndicate which expired on December 1.

The new trust corresponds to the Christiana Securities Company, which is a holding company for E. I. du Pont de Nemours & Company stock, also owned by members of the du Pont family and their associates. Although permitted by its charter to deal in securities of any type, the Rubber Securities Corporation will not acquire the stocks of any other rubber company, it was reported.

The incorporators of the newly chartered holding trust are listed as H. Elmer Humphreys, Jr., T. Warren McCaffery, W. E. Klock and Henry Davis, all of Wilmington, Del.

Holdings of the du Pont family disclosed at the last annual meeting of the United States Rubber Company were the following: Irenee du Pont, 10,000 common and 1,100 preferred shares; Constance S. du Pont, 100 common shares; Mary B. du Pont, 169 common shares; A. Felix du Pont, 500 preferred shares; and Bertha T. du Pont, 300 preferred shares. Other large blocks of the stocks are held by banking firms understood to be in sympathy with

the du Pont interests. The total number of outstanding common shares of the United States Rubber Company is 1,456,824.

A. Schrader's Son, Inc., Taken Over By Scoville Manufacturing Company

STOCKHOLDERS of the Scoville Manufacturing Company, Waterbury, Conn., voted on December 30 to acquire the entire capital stock of A. Schrader's Son, Inc., Brooklyn, N. Y., prominent manufacturers of tire valves, pressure gauges and tire tools. It is understood that the Schrader business will be operated as a practically independent unit with little or no change in policy as a result of the shift in ownership.

The purchase price has not been disclosed, but Scoville stockholders have approved the issuance of $25,000,000 5½ per cent debentures, of which, according to an official announcement, "a substantial portion" is to be used to finance the acquisition. In addition, 384,615 new shares of common stock were authorized to be used for conversion of the debentures at the holders' option. Prior to the meeting of the Scoville stockholders, the entire capital stock of A. Schrader's Son, Inc., was deposited with J. P. Morgan & Company, endorsed for transfer.

The Schrader company employs about 2,000 men and maintains plants and offices at Brooklyn, Chicago, Toronto and London. It has been a customer of the Scoville Manufcuring Company for 35 years, using the latter's brass products in the manufacture of its own items.

The Scoville Manufacturing Company, in addition to two larger plants at Waterbury owns the American Pin Company, of Waterville, makers of plumbing goods; the Oakville Company, of Oakville, manufacturers of pins and buttons; the Hamilton Beach Company, of Racine, Wis., makers of vacuum cleaners and electrical household appliances; the Gilchrist Company, of Newark, N. J., makers of soda fountain supplies; and the Moren & Van Buren Manufacturing Company, of Sturgis, Mich., manufacturers of plumbing supplies. E. O. Goss is president of the Scoville company.

Los Angeles Rubber Group, A. C. S., Elects New Officers for Coming Year

MEMBERS of the Los Angeles Group of the Rubber Division of the American Chemical Society at their ninth meeting on December 20 elected new officers for 1930. Dr. F. W. Stavely, of the Firestone Tire & Rubber Company of California, was chosen to act as chairman of the group, and F. S. Pratt, of the Pacific R. & H. Chemical Company, was named vice-chairman. W. R. Hucks, of the Pacific Goodrich Rubber Company, was selected as secretary.

Forty members of the group were present at the meeting and listened with interest to a paper read by E. W. Matthis, of the Pacific Goodrich Rubber Company, on "The Goodrich System of Wage Payment." Mr. Matthis outlined in detail the Bedaux time study system which was installed at Goodrich factories in 1926. He defined the Bedaux unit of human power measurement, giving specific examples, and explained the method of setting up these standards both for actual workers and "indirect labor" such as foremen, inspectors and supervisors.

"I wish to emphasize the fact," Mr. Matthis said in closing, "that Bedaux is not a 'cure-all,' but is an efficient tool placed in the hands of the management by which results can be obtained only by the co-operation of all concerned with the handling of this tool."

General Tire & Rubber Company Has Earnings of $1,970,000 During 1929

EXPANSION in volume of sales and a continuation of high earnings are shown in the annual report of the General Tire & Rubber Company, made public late last month. Net sales for the year ended November 30, 1928, were $27,200,160, comparing with $26,154,000 in the previous year, an increase of 4 per cent. Profit after charges but before federal taxes was approximately $1,970,000, comparing with $2,002,000 in the year ended November 30, 1928.

J. G. STOLLER

Directors of the company on December 18 declared an extra dividend of $2 per share on the common stock in addition to the regular annual distribution of $4 a share. Because tires and tubes have been selling below 1928 prices, the sales increase in dollars and cents does not indicate the fact that unit sales of the company gained 20 per cent during the year. This is in contrast with the American tire industry as a whole, which fell off approximately 5 per cent in sales during 1929.

The General Tire & Rubber Company has been expanding its factory facilities at Akron during the past year, and there have been unconfirmed rumors of the establishment of a branch plant in California or in one of the Southern states. The directors of the company last month set aside an additional amount of common stock for subscription by employes.

"Our company," declared William O'Neil, president, "is in an extremely favorable position with relation to the chain stores and the mail order houses. While they increased their distributing units 100 per cent in 1929, their net gain was less than that of our company, which increased its number of dealers only 5 per cent. This fact, together with lower prices for the product, makes the outlook for 1930 particularly happy for our distributors.

"General should not feel the effects of the slackening in demand for automobiles that is anticipated during the early part of 1930, because it is engaged exclusively in the replacement business. We have no mail order house business. The crash in Wall Street is going to slow up the mail order house business as such expansion must be financed with speculative stock market funds and those funds are not quite so venturesome at present. Furthermore, additional financing of factory-owned stores will be increasingly difficult. Present stores, with high operating costs, will be obliged to raise their prices. This will have a tendency to stabilize the business and give confidence to the regularly-established dealer, assuring him that he will not be shoved out for a new scheme of distribution."

Only one change was made in the executive staff at the annual meeting last month. J. G. Stoller, formerly assistant secretary, was elected to the post of secretary. Mr. Stoller has been associated with General since its establishment in 1915 and for three years previous to that time he was associated with Mr. O'Neil and W. E. Fouse in the Western Tire & Rubber Company at Kansas City, Mo.

The other officers are Mr. O'Neil, president and general manager; Mr. Fouse, vice-president and assistant treasurer; Charles J. Jahant, vice-president and factory manager; and Charles Herberich, treasurer. The directors, all of whom were re-elected, include Mr. O'Neil, Mr. Fouse, Mr. Jahant, T. F. O'Neil, G. F. Burkhardt, J. A. Diebold and R. W. Gallegher.

Estimates of Consumption During the

Total World Consumption is While Production Will Probably Output Will Be Important Factor—

World Rubber Production

	1928* Long Tons	1929* Long Tons	What THE RUBBER AGE predicted for 1929 Long Tons	Predicted for 1930 Long Tons
British Malaya	299,652	445,000	385,000	460,000
Netherland East Indies	225,983	260,000	265,000	285,000
Ceylon	57,267	80,000	80,000	90,000
India and Burma	10,790	12,000	12,000	14,000
Sarawak (Malayan imports from)	10,087	11,000	12,000	11,000
British North Borneo	6,698	7,000	8,000	7,000
Siam (Malayan imports from)	4,813	5,000	5,000	5,000
Indo-China	9,616	9,000	10,000	9,000
Brunei (Malayan imports from)	484	500	500	500
Philippine Islands	309	300	400	400
Papua, Samoa and Fiji	482	600	750	600
Amazon Valley	21,129	21,000	25,000	20,000
Other America, except Guayule	1,490	900	.....	1,000
Guayule (United States imports of)	3,076	1,500	.....	500
Africa	6,124	5,000	7,000	6,000
Total	658,000	858,800	810,650	910,000

*Official figures, estimated from latest returns, released by the U. S. Department of Commerce.

THE production of crude rubber during 1930 should show an increase over 1929. The advance in output has been yearly increasing and 1930 should not prove any exception, even in spite of low prevailing market prices on the various rubber exchanges. The consumption of crude rubber will also advance during 1930, but at a lower percentage over 1929 than has been registered in previous years, primarily because of the unfavorable statistical and technical positions in which crude rubber found itself at the close of the year. The average increase in consumption over the last six years has been 16 per cent per annum. During 1930 it is doubtful if the increase will be more than 4 per cent. High stocks on hand and afloat to consuming markets and low consumption in the United States for the last three months of the year, coupled with high production of crude on the estates and by native interests, has brought about a situation which can be described as poor from a statistical standpoint, but the outlook for 1930 is still bright.

1930 Figures Higher Than 1929

THE RUBBER AGE estimates that the production of crude rubber during 1930 will reach 910,000 long tons while world consumption during the year will total approximately 830,000 tons. The accompanying tables give in detail the estimates by producing areas and consuming countries. It may be recalled that THE RUBBER AGE, in its April 25, 1929, issue, made a prediction for 1929. These estimates have followed closely the actual returns as received to date. The accompanying tables also show the 1929 predictions as compared with actual production and consumption figures during the past year, as reported officially by the estimates of the Department of Commerce.

The year 1929 has been generally a favorable one for the rubber manufacturing industry both here and abroad. The industry has benefited by fairly stable commodity markets in both crude rubber and cotton and no losses have been sustained in crude rubber inventories by virtue of heavy fluctuations in crude rubber prices. Unit sales have exceeded the most sanguine hopes and in spite of lower wholesale and retail unit prices, profits have generally been reported by the majority of the industry. A similar profitable year should continue during 1930.

In view of the present crude rubber stocks and the estimated high production of crude rubber during 1930, market levels should not advance and should remain around 15 to 17 cents per pound.

Estimates for Tire Replacements

The action of President Hoover in attempting to stabilize prosperity throughout 1930 by accelerating public building programs and the construction of public works together with the other industrial expansions which are planned, should increase the application of mechanical rubber products in all lines. There is no reason to believe that the financial deflation in November, 1929, and its subsequent repercussions in industrial activities will upset trade to an extent sufficient to cause a decrease in rubber consumption. The huge world registration of automobiles, now totalling approximately 30,000,000 vehicles, should present a formidable tire replacement market, which should absorb at least 60,000,000 new tires during 1930. It is also reported that as from the first of the year the size of tires used on Ford, Chevrolet, Durant and other cheap lines of cars will be increased from 4½ inches to 4¾ inches. This will make for a larger tire with an increase in the amount of rubber consumed in its manufacture. The only authority so far to make a prediction as to the tonnage to be consumed in the United States in tire manufacture in 1930 has been Symington and Sinclair. Their comment as far as rubber consumption in tire manufacture and sales during the present year is as follows: "The rubber content in a set of tires and tubes has increased nearly 2 pounds since the beginning of 1928, and during the September quarter of 1929, 11.81 pounds per set. Reckoning a 12-pound average for 1930, with a production of 4,000,000 new cars requiring five tires each, an export of 2,000,000 tires and replacements of 2.30 tires per car registered at the end of the year, the following would be the requirements:

20,000,000 tires for new cars,
2,000,000 tires for export,
59,800,000 tires for replacements,

81,800,000 tires at 12 pounds each, or 438,000 tons of rubber for the tire trade alone. Calculating this to be 85

Production and Crude Rubber Year 1930

Expected to Reach 830,000 Tons Climb to 910,000 Tons—Native Tire Replacements Should Be Large

per cent of the total, the total consumption in the United States during 1930 should amount to 515,000 tons."

It is believed that this estimate is higher than can be reasonably expected. The great hope for the industry during 1930, of course, lies primarily in the tire replacement market and with world registration daily mounting a good tire business is assured. Figuring even two tires per car for replacements will call for 60,000,000 new tires during the year. The present production estimates of new automobiles for the year call for at least 4,000,000 cars, which will need at least 16,000,000 new tires, making a potential market for 76,000,000 tires, which is the same amount as was produced in 1929. But in view of the greater mileage now developed by the leading brands of tires it may be doubtful whether replacements will maintain at a rate of two tires per car. Also some portion of this replacement demand will come, of course, from the large stocks already in dealers' hands, so that the total production of tires which can safely be absorbed during 1930 will more nearly be in the neighborhood of 70,000,000 tires.

No "Restriction" Schemes Are Expected

The various "central selling" schemes recently proposed by both British and Dutch plantation interests, as aids to increase the price of crude rubber, will in all probability fail because of lack of any unanimity amongst the individual estate owners and particularly because of the impossibility of consolidating the native producers so as to have them accept any preconceived plan.

In the accompanying tables showing the predictions of THE RUBBER AGE for 1930, the crude rubber production figures are based on probable export figures from producing areas and do not include stocks on hand which must be carried over from 1929. The consumption estimates are largely based on previous yearly import figures and the rates of increase in rubber consumption during 1929 in each individual manufacturing country.

Greater activity in the manufacturing industry is looked for in the second half of 1930 than in the early months of the year. With tire inventories still high and stocks in dealers' hands at a record peak sales must preceed any further restocking of new equipment. The production schedules of most of the factories call for a curtailment to meet this situation and it is doubtful, even in spite of spring dating programs, whether any of the plants will operate at capacity for the first three months of the year. But after that period, full production schedules can be expected.

It is also expected that the consumption of crude rubber in mechanical goods, rubber footwear and rubber sundries during 1930 will exceed that of 1929. New floor tilings, rubberized fabrics, hose, belting, rubber toys, and drug sundries should easily consume an additional 20,000 tons over the total of 1929 used in these lines. New applications for liquid latex will also figure more prominently in the totals of crude rubber consumption during 1930 than in past years. Liquid latex is being more extensively used in all dipped goods production and in molded processes.

One important factor which can be stressed is that most of the rubber manufacturing companies are in a favorable financial position and have ample credit facilities. Moreover, most of them are going to show substantial profits for the year or at least a more favorable balance sheet over what they presented last year.

The following table shows a comparison between the output of automobiles and the amount of rubber consumed in tire manufacture and other rubber goods:

	1928	1929	1930
U. S. Auto Production	4,350,000	5,400,000	4,000,000
U. S. Tire Production	78,600,000	76,000,000	76,000,000
U. S. Rubber Consumption (tons):			
In tires, tubes, etc.	378,629	400,000	400,000
In other products	63,598	71,000	90,000
	442,227	471,000	490,000

Present Prices Will Not Affect Output

The market price of crude rubber will not materially affect production during 1930. Estates have revamped their costs and applied scientific methods to increase the average yield per acre. Native holdings can be worked at a profit even at lower prices than now prevail. While rubber stands untapped it represents no profit and it is to be assumed that no tappable areas will remain rested when they can be turned into revenue, no matter how small the return.

The phenomenal production in British Malaya during 1929 has not been satisfactorily accounted for by even the most expert authorities. The output during 1929 exceeded the most optimistic predictions. From a production of

World Rubber Consumption

	1928* Long Tons	1929* Long Tons	What THE RUBBER AGE predicted for 1929 Long Tons	Predicted for 1930 Long Tons
United States	437,000	475,000	485,000	490,000
United Kingdom	48,500	65,000	55,000	75,000
Germany	37,800	49,000	45,000	55,000
France	36,500	54,000	43,000	60,000
Canada	30,400	35,000	35,000	40,000
Japan	25,600	30,000	28,000	35,000
Italy	12,400	17,000	14,000	20,000
Russia	15,100	11,000	10,000	12,000
Australia	8,400	15,000	12,000	16,000
Belgium	8,000	9,000	8,500	10,000
Other countries	21,000	25,000	20,500	26,000
Total	680,700	785,000	756,000	830,000

*Official figures, estimated from latest returns, released by the U. S. Department of Commerce.

Favorable Factors for an Increase in Rubber Production

1. New areas coming into bearing during 1930—estimated at 80,000 acres.
2. New scientific methods in practice on estates which have increased the yield per acre.
3. Large native holdings which will be tapped to the limit even at present market prices.

Unfavorable Factors Against an Increase in Rubber Production

1. Present low market prices may militate against capacity production on individual estates.
2. High stocks already on hand on estates and in consuming markets.
3. Unfavorable economic conditions in the Amazon region, Siam, Indo-China and Mexico (Guayule).

Favorable Factors for an Increase in Rubber Consumption

1. Increasing world automobile registrations, insuring a large replacement market.
2. Continued maintenance of automobile production, insuring large original equipment market.
3. Building and construction programs, public works, etc., demanding a large supply of mechanical rubber goods.
4. Good rubber footwear business during present winter, calling for restocking of new goods during 1930.
5. Low prices of crude rubber, making purchases of crude stocks advantageous and possibly reducing the use of reclaim.
6. Continued new applications of rubber for various uses.
7. Increasing use of rubber in aviation and in automobile construction.

Unfavorable Factors Against an Increase in Rubber Consumption

1. Present high stocks of crude on hand and afloat at consuming markets, which must be absorbed before new rubber is stocked.
2. Present high stocks of tires and tubes in dealers' hands which must be absorbed.
3. Greater mileage developed by leading brands of tires which give longer life to present equipment and will reduce the rate of replacements.

299,652 tons in 1928 the output jumped to 445,000 tons during 1929. This total production figure represents total net exports minus imports and plus stocks at Singapore and Penang and on the estates at the close of December. The most satisfactory explanation of this huge increase in Malayan production is that acreage figures in general and for native rubber in particular, have always been underestimated by British authorities and that the yield per acre for native rubber has always been set too low. It is estimated that a total of 2,700,000 acres of native rubber are now tappable in British Malaya.

It is reasonable to suppose that this rate of production during 1929 will show no decrease during 1930 and that other new areas maturing will bring the total for British Malaya to 460,000 tons.

Native Production Is Important Factor

Native production in the Dutch East Indies will be the important factor in the output from that region. Rumors, having considerable authoritative basis, continue to the effect that native production will show a surprising increase. All reports from the Dutch East Indies confirm this belief and the area of such native holdings, now mature, is set at not less than 350,000 acres, with an average yield of 700 pounds of dry rubber. Even at present low prices the greater majority of these native holdings will be tapped during the year and it can be conservatively assumed that production in the Dutch East Indies will show at least an increase of 25,000 tons over 1929.

New maturing areas in both Ceylon and India should advance the figure for production in both of these regions. There will be little change, if any, in the output from other areas. There is no indication that production will increase in Sarawak, Brunei, British North Borneo, Siam or Indo-China. Slight declines, in fact, may be expected from the two latter areas, due to unfavorable economic conditions. A slight increase of possibly 100 tons can be expected from the Philippines due to new rubber coming into bearing and a slight advance in the African output can be expected from new tappable areas on the Firestone properties in Liberia. In view of the present market price levels, Guayule production will doubtless show a decline and for the same reason there will be little or no change in production from the Amazon region. It is far too early to see any results from the Ford concession, although it is reported that 10,000 acres have been laid out during the last year.

It will therefore be seen that the predicted increase in production of crude rubber during 1930 will come mainly for the two areas, British Malaya and chiefly from the Dutch East Indies, the native production being the chief factor in the latter case.

Increase in Consumption in U. S. Expected

The consumption of crude rubber has generally shown a steady increase year by year and 1930 will be no exception. The rate of yearly increase in the United States has been somewhere around 12 to 16 per cent. This year the increase will probably not be nearly so great and may even drop to a gain of only a few thousand tons or approximately 4 per cent over 1929 but the total world consumption should certainly exceed 800,000 tons.

As before stated the consumption of crude rubber in tire manufacture in the United States will probably show no increase. More tonnage, however, is expected to go into mechanical rubber goods and footwear. The present winter has been a good one for the rubber footwear trade and stocks have declined to a point where production can proceed at an increased pace.

There was a surprisingly large increase in consumption of rubber in the United Kingdom during 1929. It is fair to assume in the light of the good automobile sales this year in that territory and in view of the protection to home-made tires afforded by the McKenna duties, that tire sales will increase in the United Kingdom, advancing crude rubber consumption during 1930 to at least 75,000 tons.

With the world market for automobiles continuing on the increase there appears no reason to believe that tire manufacture abroad should decline, but on the other hand should show a slight increase in all manufacturing countries. German and French production in all kinds of rubber goods should particularly show a gain in the light of their increasing export markets. Canadian consumption has shown a steady increase yearly and a corresponding advance should occur in 1930. Japan, Russia and Italy, in view of improved internal economic conditions should also use more rubber this year.

A factor in the situation of no small importance in considering the probable consumption of crude rubber is the possible position of reclaimed rubber during the year. With the present price levels for crude rubber prevailing there is little chance that reclaimed will displace crude in any greater proportions than it did during 1929. Reclaimed will continue to be used at about the rate of 50 per cent to the amount of crude and if crude prices drop below 15 cents, this rate may decline to around 40 per cent.

The tonnage of crude rubber carried over in stocks on hand and afloat throughout the world on January 1, approximated 300,000 tons. These stocks will militate against any advance in market prices and it can be therefore assumed that crude rubber will be more stabilized during the ensuing 12 months than during any previous yearly period.

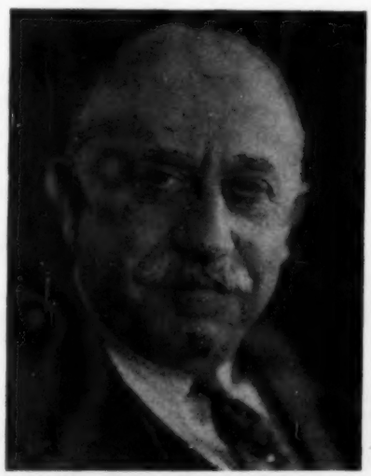
Seiberling Calls for Greater Cooperation in the Industry

Annual Meeting and Banquet of the Rubber Manufacturers Association Held at Hotel Commodore, January 6th—Samuel Woolner Elected President for 1930—700 Attend Dinner.

AT the annual meeting of the Rubber Manufacturers Association, held at the Hotel Commodore, New York City, January 6, Samuel Woolner, Jr., president of the Kelly-Springfield Tire Company, was elected president of the organization for the coming year. Other officers chosen included J. D. Tew, president of B. F. Goodrich Company, as first vice-president; C. D. Garretson, president of Electric Hose and Rubber Company, as second vice-president, and W. O. Cutter, vice-president of United States Rubber Company, as treasurer. A. L. Viles was also re-elected as general manager.

The following were re-elected to the board of directors of the Association for a term of three years: F. B. Davis, Jr., president, United States Rubber Company; C. D. Garretson, president, Electric Hose & Rubber Company; J. A. Lambert, vice-president, treasurer and general manager, Acme Rubber Manufacturing Company; William F. Pfeiffer, president, Miller Rubber Company; Samuel Woolner, Jr., president, Kelly-Springfield Tire Company.

P. W. Litchfield, president of the Goodyear Tire & Rubber Company, who retired as president of the Association in 1929, and F. A. Seiberling, president of the Seiberling Rubber Company, who retired as president of the Association at this meeting, resigned from the board of directors and C. A. Slusser, vice-president of the Goodyear Tire & Rubber Company, and W. S. Wolfe, vice-president of the Seiberling Rubber Company, were elected to fill the unexpired terms of Messrs. Litchfield and Seiberling, respectively. As ex-presidents of the Association, both Mr. Litchfield and Mr. Seiberling remain as ex-officio members of the board so long as they are connected with the Association.



SAMUEL WOOLNER, JR.,
Newly Elected President of the Association for 1930

The business meeting was of short duration and was attended by less than fifty representatives. Only routine business was transacted and the reports of general manager and treasurer approved. Total expenditures for the year reached $246,088.44 which, together with the loss on the 1929 dinner and depreciation charges, brings the total to $252,231.26. Revenues during the year reached $235,525.42, leaving a deficit of $16,705.84 for the year's operations. The assessment to members for the ensuing year was not changed and will remain at 2¾ cents per hundred pounds of rubber consumed.

Immediately upon the close of the general business meeting the board of directors met separately for the election

Governor Theodore Christianson of Minnesota, Principal Speaker of the Evening

of officers, as named above. A luncheon for all those in attendance immediately followed the board meeting.

In the submission of his report on the activities of the Association, Mr. Viles, as general manager, called attention to the fact that over seventy meetings of the various divisions, committees and sub-committees were held during 1929. His summary was as follows:

"The policy of having as few meetings as possible consistent with the needs of various groups was continued this year in order to save time and money of members and to make each meeting thoroughly worth while. To serve this purpose, the services of the Association staff were utilized to a greater degree than heretofore in developing matters between meetings and maintaining contact with members at their plants.

"The Association finances are in a healthy condition, although it became necessary late in the year to draw on the surplus funds to meet some of the special work authorized by the members and directors.

"1930 may be expected to bring an increased number of problems which will require the fullest cooperation of the Association members and a maximum measure of service by management and staff, which we are prepared to meet."

The annual banquet of the Association, which always follows in the evening of the annual business meeting, was held in the Grand Ball Room of the same hotel at 7:30 p. m. During the excellently served dinner music was rendered by the Commodore Hotel Orchestra. Giovanni Martinelli, the premier tenor of the Metropolitan Opera also sang several numbers including the famous aria "Celeste Aida."

Officers of the Rubber Manufacturers' Association, Inc., for 1930

President—Samuel Woolner, Jr., president, Kelly-Springfield Tire Company.

First Vice-President—J. D. Tew, president, The B. F. Goodrich Company.

Second Vice-President—C. D. Garretson, president, Electric Hose and Rubber Company.

General Manager—A. L. Viles.

Treasurer—W. O. Cutter, vice-president, United States Rubber Company.

Assistant Treasurer—H. B. Delapierre, treasurer, Kelly-Springfield Tire Company.

Secretary—A. D. Kunze.

Assistant Secretaries—George Flint, R. H. Goebel, C. W. Halligan, Earl Langstroth and A. C. Grimley.

The speaker of the evening was Governor Theodore Christianson, of Minnesota, who spoke on the desirability of restoring the industrial balance as between agriculture and industry. H. S. Firestone, Sr., was then introduced and spoke extemporaneously on the difficulties encountered by the industry during his thirty-five years connection with rubber tire manufacture.

The feature of the evening, however, was the concluding address of the toastmaster and retiring president of the Association, F. A. Seiberling. In a forcible speech he sounded a warning to the industry that without greater cooperation on the part of individual companies, the industry as a whole would face disastrous conditions, that selling below cost must stop and that a stabilization within the industry, both as regards rational production and a maintenance of steady labor employment must be effected before any real prosperity can be assured. He stressed the growth of the industry to the present time, when over 400 establishments in the United States are engaged in the manufacture of rubber goods and do a business aggregating $2,100,000,000. The number of wage earners now employed total 150,000. While he painted a rather black picture of the state of the industry at the moment, he expressed confidence in its basic soundness and stated that while the time was not one for any expression of "morbid pessimism or sentimental optimism," he believed that the industry could look forward to a good year, after the first three months, provided that a closer spirit of cooperation manifested itself throughout the industry.

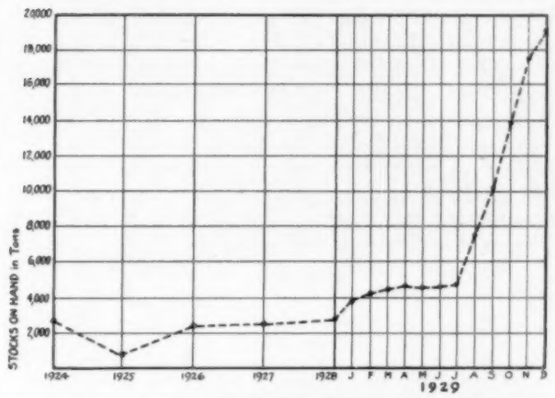
Tire Fabric Census

THE recently published census figures for 1927 covering cotton manufactures, gives the following table showing the production of tire fabrics by class, quantity and value for the entire United States.

Total production of Tire Fabrics—		
United States—		
Total pounds	197,353,058	189,355,195
Total square yards	225,931,642	242,126,459
Total value	$80,974,199	$105,625,894
Cotton-growing States—		
Pounds	113,203,157	86,233,101
Square yards	121,146,926	112,975,565
Value	$44,513,833	$44,722,472
New England States—		
Pounds	70,034,740	73,764,042
Square yards	87,572,222	90,936,559
Value	$30,959,916	$43,425,210
Cord fabrics for tires—		
United States—		
Pounds	160,612,114	140,492,454
Square yards	179,740,778	176,964,466
Value	$66,974,970	$80,478,625
Cotton-grawing States—		
Pounds	88,758,924	56,750,641
Square yards	92,067,547	73,680,626
Value	$35,483,345	$30,502,960
New England States—		
Pounds	61,238,526	59,114,802
Square yards	74,739,784	70,903,101
Value	$27,257,310	$35,082,552
Tire duck—		
United States—		
Pounds	30,164,943	32,081,733
Square yards	35,474,346	40,761,508
Value	$11,343,197	$16,628,610
Cotton-growing States—		
Pounds	20,418,388	22,296,209
Square yards	22,909,757	28,899,184
Value	$7,548,751	$10,860,246
Tire fabrics other than card and duck—		
United States—		
Pounds	6,576,001	16,771,008
Square yards	10,716,518	24,400,485
Value	$2,656,032	$8,518,659

Growth of LIVERPOOL *as A Centre for Rubber Stocks*

Rubber Tonnage at That Port Is Now Nearly Ten Times the Quantity of One Year Ago



This chart shows graphically how Liverpool stocks of crude rubber have increased from around 2,000 tons to nearly 20,000 tons

LATE in the summer of 1928, when the end of restriction was imminent, and when it was realized that abnormally large stocks of rubber would soon be shipped to this country, several prominent rubber importers invited Alfred Holt and Company, the well-known firm of shipowners, to devise a plan with them for the handling of greater quantities of rubber at Liverpool. It marked the first stage of a scheme that promptly took practical shape, quickly justified itself by results, and still promises many interesting developments.

For many years Messrs. Alfred Holt and Company have been closely identified with the shipping side of the rubber industry. It was in 1865 that the late Mr. Alfred Holt founded the firm to trade with the Far East. Originally it was known as the Ocean Steam Ship Company, but since the early part of the century, when the management of the China Mutual Steam Navigation Company was taken over, it has been famous the world over as the Blue Funnel Line.

Inevitably it has been increasingly a carrier of the produce of the plantations. As today no fewer than eighty-five vessels, the largest fleet in any private ownership, sail under its flag, giving an unrivalled weekly service between Great Britain and the great rubber-growing territories of the Malay States and the Dutch East Indies, it is surely not inappropriate that the name of this progressive concern should be linked with so important an enterprise on the Mersey.

Standing on the south side of the Gladstone Dock, which the largest ships afloat can enter or leave irrespective of the state of the tides, are a fine sweep of three-story sheds, built of ferro-concrete and accordingly fireproof. Shortly after the dock had been opened by King George in 1927 these were appropriated by Alfred Holt and Company for the discharge of their cargoes. It was soon realized, however, that here was an opportunity for offering importers the facilities of quayside storage, with all the economies and conveniences that these would provide.

Not merely could goods be discharged by electric cranes from the ships' holds direct to the warehouse—obviously a speedier process than any of the older methods of transporting from the ship to some distant depository—but there would be an automatic and immediate saving in cartage or lighterage expenses and in quay porterage charges. So it came about that the top floors were registered as warehouses for the storage of hemp, cotton, and general produce, and

STORING RUBBER IN WAREHOUSES AT LIVERPOOL

A section of Holt's Warehouse is shown at the left, with a view of the weighing of rubber at the right and of sampling in the upper picture

such was the success that additional sheds had to be taken.

Faced with their own difficult problems, incidental to the almost summary ending of the restriction policy, the leading rubber importers sought to share in these advantages. It was realized that, apart from its natural role as a port, Liverpool was ideally suited as a stock-holding center for the industrial North of England. It was also realized that, in addition to what might be called the geographical argument, quayside storage would mean all-important economy and expedition in sundry respects. "Holt's Warehouse," as it was called, was thus surveyed and approved by representatives of the Rubber Trade Association, and the Mersey Docks and Harbor Board agreed to reduce considerably their inward dock and town dues. The proprietors themselves compiled a schedule of all-in rates for the forwarding of rubber to all parts of the country and abroad, and a competent sampling and grading staff was engaged under the expert direction of George T. Lloyd. Ships containing big rubber consignments soon began to arrive, and thanks almost exclusively to this enterprise Liverpool rubber stocks have bounded almost miraculously in a short twelve months from 2,000 to 19,000 tons.

It is obvious that here there is the promise of interesting developments. Liverpool was itself an important rubber market in the earlier days of the industry, and it is possible, though more need not and should not be claimed at this moment, that it may regain competitively some appreciable part of its old position. Certainly as a port adjacent to the big industrial areas of the country it has many natural advantages.

Rate for Handling is Lower

Liverpool's consolidated rate for the working of rubber is about 22s a ton lower, it is claimed, than the rates in operation at other places. This means a saving of one-eighth of a penny per pound of rubber, and with the commodity at its present depressed price that is no inconsiderable economy. Largely it is brought about by the elimination through the agency of this modern dockside warehouse of cartage charges to up-town warehouses, the reduction similarly of quay porterage charges, and the lessening of the number of handlings, which in turn avoids possibility of damage. Nor is that the whole of the story.

By virtue of the fact that the rubber is discharged direct to the warehouse, the work of weighing and sampling begins at once, and from first to last the whole process of marketing is speeded up. Samples are sent from Liverpool to London by train each evening, and there is the guarantee that by 10 o'clock the following morning they shall be on the counters of the Mincing Lane brokers, a clear saving of several days in comparison with rubber which may have reached British shores about the same time, but which has not happened to be consigned to Liverpool by a vessel discharging alongside Holt's Warehouse.

Clearly, too, there is considerable saving in time and transport charges when buyers in the North and in the Midlands, where many of the biggest manufacturers are centered, can draw on quickly accumulating stocks "ex-Liverpool." So far as the enormous American market is concerned, it is found that rubber can be shipped from Liverpool to New York more expeditiously, and at less cost, than it can from any other port in the United Kingdom or the Continent, and there are possibilities that this fact alone will bring a thriving additional trade to the Mersey.

Holt's Warehouse undertakes the handling of rubber arriving from the East not only by the Blue Funnel Line but by several other large steamship companies, among them the Hamburg-Amerika Line, Rotterdam-Lloyd, and Stoomvaart Maatschappij Nederland.

NOTE—The above article is reprinted from the British Rubber Industry Supplement to the London *Daily Telegraph*, November 19, 1929.

Deflated Airwheel Tires

IN connection with the "Airwheel," which has been recently developed by the Goodyear Tire & Rubber Company for application on airplanes, the question has arisen as to what would happen if an airplane equiped with these tires should land with them deflated or severely puncture them in landing.

The Goodyear Company has anticipated this question and as a result of several experiments has now released a report on the subject which refutes any implication that such a contingency might result in disaster.

Tests to date indicate that the answer to the inevitable question is, "nothing." Deflation of an airwheel from

puncture or any other cause does not prevent it from serving as an excellent cushioning, or seriously interfere with manoeuverability of the plane on the ground in landing.

At the Mid-City airport, near Akron, C. O. Bell, Goodyear test pilot, made numerous take-offs and landings with a Bird biplane, equipped with 22 x 10 airwheels, one of which was deliberately cut through casing, fabric and tube for five inches. It is presumed that no plane will be taken off with a deflated tire in actual practice but this was done in tests to make them more exacting and conclusive.

Throughout the tests conducted during the first week of October, the same damaged tire was used but at no time did the plane show as great a tendency to ground-loop as is common to deflated high-pressure equipment for similar ships.

In landing with a deflated high-pressure tire and the conventional wheel, the side stress frequently results in complete collapse of the wheel and a ground-loop both violent and sudden. In landing with the damaged airwheel, the tire takes the greater share of the strain and serves as a cushion. Meanwhile the ragged hub is permitted to turn without hindrance, providing a rolling contact with the ground regardless of the condition of the airwheel.

Moving pictures taken by a camera mounted upon the underwing of the plane, reveal that in taking off the ship quickly came up to an even keel with the damaged tire forming a cushion for the rapidly revolving hub. Soon after the plane cleared the ground the tire resumed its natural balloon-like shape and fit so closely to the hub that it would have been impossible to detect that it contained no air pressure had this fact not been known.

In tests every effort has been made to strip one of the new airwheels from its hub, while either inflated or deflated, but to date this has not been accomplished. The flanges of the hubs are so designed that accidental stripping of an airwheel in landing or turning upon the ground is believed to be impossible. Conditions under which the deflated airwheel tests were conducted were far more severe than are likely to be encountered in actual practice.

The Question *of* Vulcanization Without Sulfur*

Experiments on Hot Vulcanization and Vulcanization in Ultraviolet Light with the Aid of 1, 3, 5-Trinitrobenzene in Picric Acid

By F. KIRCHHOF

Vulcanization With Heat

THIS subject has been previously treated by L. Eck.[1] The present article contains merely the results of a few experiments, which, as might be anticipated, seem suited to assist but little the progress of sulfur's new rivals.

We recall that Ostromislensky[2] is said t ohave succeeded in obatining vulcanizates of technical value by means of nitro-compounds, especially 1, 3, 5-trinitrobenzene, in the absence of sulfur or any substance forming sulfur.

It is difficult to obtain the trinitrobenzene (TNB for short) recommended by Ostromislensky, as it apparently has not been manufactured in Germany since the end of the war. The first experiments were therefore carried out with the analogous compound, 2, 4, 6-trinitrophenol, in which the nitro groups are in the same symmetrical position as in TNB, and which is more frequently met with under the name of picric acid. The percentages given by Ostromislensky were used, and also the accelerators, or more properly activators, litharge and carbon black.

A mixture consisting of

	Parts by weight
Brown crepe	100
Litharge	30
Picric acid	0.5

was stored for several days and then press-cured at 140°C. The mass remained soft and tacky, and showed no indication whatever of vulcanization.

A second mixture which contained in addition to the above ingredients twenty-five parts by weight of American gas black was heated under the same conditions as the first with the following results:

60 min. at 140°C—weakly vulcanized
120 min. at 140°C—more strongly vulcanized

The addition of gas black therefore seems to play an essential role, and litharge alone, which is so effective in sulfur vulcanization, has in this case a retarding or depolymerizing effect.

Among the "vulcanizates" thus obtained there are none that may be considered as similar to the vulcanizates obtained with sulfur. On the contrary, tough, leathery, inelastic products resembling reclaim are obtained, which have but one characteristic in common with sulfur-vulcanizates, viz., insolubility in rubber solvents. It may be remarked that the second mixture before heating was completely soluble in benzene despite its high content of gas black, while the heated samples retained their shape and swelled but little after lying for weeks in benzene.

Since this swelling characteristic is indicative of vulcanizates only "in the broadest sense" (even reclaim shows it), then it alone is not sufficient reason for classifying the products obtained by Ostromislensky's method as "vulcanizates" without further ado. Their physical properties, such as toughness are not to be ignored, but their elasticity and extensibility leave much to be desired. In this respect also they resemble low grade black reclaim, and at best can only be called "pseudo-vulcanizates."

It might be objected that 2, 4, 6-trinitrophenol (called TNPh for short) might not have the same effect as TNB. After some effort the author succeeded in obtaining a few tenths of a gram of this costly material, and the above experiments were repeated with it.[3] Because of the small quantity of substance available, the experiments could only be carried out with rubber solutions. To a 25% solution of Para rubber in benzine there was added a concentrated benzene solution of TNB, corresponding to 1% TNB on the rubber content.

To this base there was now added:

a) litharge 30 parts by weight to 100 of rubber
b) gas black 30 parts by weight to 100 of rubber
c) Equal amounts of a) and b) were mixed.

The solutions were poured on glass plates, and allowed to dry completely, warming gently. The films thus obtained were about 0.5 mm. thick, and were heated in an air oven at 140°C. for 30, 60, and 120 minutes respectively.

The results were as follows:

Compound	Cure in minutes	Appearance of film
Base mix	60	Surface dry, but mass unvulcanized.
	120	Surface tacky, mass unvulcanized.
a) ditto + PbO	60	Surface markedly tacky, mass unvulcanized.
	120	ditto
b) ditto + gas black	60	Surface not tacky, mass unvulcanized.
	120	ditto
c) ditto + PbO + gas black	30	Surface dry, mass weakly vulcanized
	60	ditto
	120	Mass slightly tacky.

It is interesting to observe that a "surface vulcanization," indicated by the disappearance of tackiness, could be noted only in the base mix. The litharge-gas black mix is not considered, as gas black alone causes a dry surface. The mix containing litharge alone showed clear signs of depolymerization on the surface as well as in the interior, as in the case of the TNPh mix.

Therefore in the presence of the nitro compounds TNB and TNPh, litharge has no accelerating action such as it possesses in sulfur mixes. The changes effected by these nitro compounds cannot be identified with sulfur vulcanization without further ado.

To all appearances the changes in the rubber observed by Ostromislensky belong in the great category of those isomeric transformations brought about by sulfuric acid, sulfo-acids, sulfur chloride, etc., as described by Kirchhof, Fisher, and others.[4] Such changes can even take place to some extent in sulfur-vulcanization, probably especially in the case of reversion or overcure and in reclaiming sulfur-vulcanizates. At any rate the products obtained resemble physically those produced by cyclicizing agents or by the nitro compounds of Ostromislensky.

Vulcanization With Ultraviolet Light

It was interesting to see if TNB and TNPh behaved like sulfur under the influence of ultraviolet light. For this purpose twenty per cent solutions of Para rubber were mixed with one to three per cent of the nitro compound, and evaporated to dryness on polished quartz plates. When the films thus obtained were completely dry, they were exposed, either directly or hermetically covered by a sec-

*Translated by J. P. Fahy from *Gummi-Zeitung*, Vol. 44, No. 5, pp. 252-253, Nov. 1, 1929.

and quartz plate, to the action of a quartz lamp (220 v., 2 amp.) at a distance of 15 cm. (Temperature 65°C.)

The rubber film containing 3% TNPh was completely dry on the surface after one hour's illumination and had a slight metallic shimmer, whereas an unprotected rubber film without TNPh exposed for an equal length of time became extremely tacky on the surface. The TNPh film also showed some elasticity and extensibility and had become quite insoluble in benzene, even when the effect of the ozone which was formed was excluded by covering the film with a second quartz plate.

Still more striking was the change in the film containing 1% TNB. The latter became intensely brownish-yellow and clear as glass after exposing each side of a film between two quartz plates for one hour. It showed good elasticity and an elongation of 600 to 700%, but part which was exposed on one side was weakened by oxidation and showed an elongation of only 400 to 500%. These vulcanizates therefore are clearly different from those obtained by heating as above described. However, they may have no practical importance.

Through the researches of Porritt and Asano[5], it has been shown that rubber in solution or in a thin film is transformed by short-wave ultraviolet light into what is probably an isomeric form (called by Kirchhof, photo-cyclo-rubber). This change is strongly accelerated by certain substances such as white phosphorus and selenium[6], as evidenced by the gel formation of the solution.

Probably the vulcanization by light of mixtures containing sulfur discovered by Bernstein in 1912 belongs to this class, as a form of sulfur activiated by the ultraviolet light has an analogous accelerating action on the transposition and the combination with sulfur of the rubber which is depolymerized by the ultraviolet light.

The effectiveness of ultraviolet rays depends upon the transparency of the irradiated substance. Rubber itself, especially in a thin layer, is quite permeable to ultraviolet light[7], but any change in its transparency through the addition of fillers would have a marked effect on the intensity of the change produced by ultraviolet light. Picric acid with its strong yellow color makes a film of rubber 0.1 mm thick completely impermeable to ultraviolet light, but a film of rubber 0.4 mm. thick containing 1% TNB remains completely permeable. This permeability completely disappears during the irradiation, even in the case of films covered with quartz plates where oxidation is excluded. A film of pure rubber irradiated for two hours and also a film of rubber containing 1% TNB which was heated for two hours in an oven at 140°C. showed no change in their permeability to ultraviolet light. This phenomenon in the case of a film containing TNB is accordingly wholly analogous to the displacement of the absorption boundary for ultraviolet light observed in sulfur vulcanization, which parallels the chemical combination with the sulfur[8], as indicated by the saturation of the double bonds. Hence, of course, the effect of TNPh in the presence of ultraviolet light is also limited to the surface only, as its marked absorptive power prevents the penetration of active rays to deeper layers[9].

In conclusion the results obtained with the nitro compounds TNB and TNPh may be formulated as follows: The "hot vulcanizates" obtained with these substances in the presence of considerable quantities of gas black, which apparently acts as a necessary surface catalyst, have a physical resemblance to reclaim or certain cyclo-rubbers, and may also resemble them chemically. Hence they can only be spoken of at best as "pseudovulcanizates."

The ultraviolet vulcanizates first observed by Kirchhof possess an essentially different behavior, especially those containing TNB, resembling cold cures physically, and chemically, too, in so far as they are analogous to the latter or even to sulfur-vulcanizates in showing marked absorption of ultraviolet light even in a thin film, thus indicating the saturation or transposition of the double bonds in the rubber hydrocarbon molecule[10].

Notes

(1) *Gummi-Ztg.* **43**, 2481 (1929).
(2) *India Rubber World*, **80**, 55 (1929); *Gummi-Ztg.* **42**, 2378 (1929).
(3) This was obtained through the courtesy of Dr. W. Esch. It was identified as 1, 3, 5-trinitrobenzene by its melting point of 119-120°C., its crystal form and its solubility. The crystalline form of both nitric compounds (monoclinic and rhombic) are remarkably similar to that of sulfur; also their melting points (121°C. and 122°C. respectively) lie close to that of sulfur (S mon. = 119°C.)
(4) *Kautschuk*, **2**, 1 (1926); **4**, 142 (1929).
(5) *Kautschuk*, **3**, 239 (1927).
(6) *Kautschuk*, **3**, 28 (1927).
(7) *Gummi-Ztg.* **43**, 22 (1929).
(8) *Ind. Eng. Chem.* **17**, 808 (1925).
(9) The photographs taken will be published later.
(10) Apparently in these chemical changes the nitro groups are strongly disrupted (reduction and addition to the double bonds of the rubber hydrocarbon?); this would explain among other things the intense yellowish-brown color of the films after irradiation, as TNB and TNPh irradiated alone show no change in intensity of color.

Electro-Draulic Press

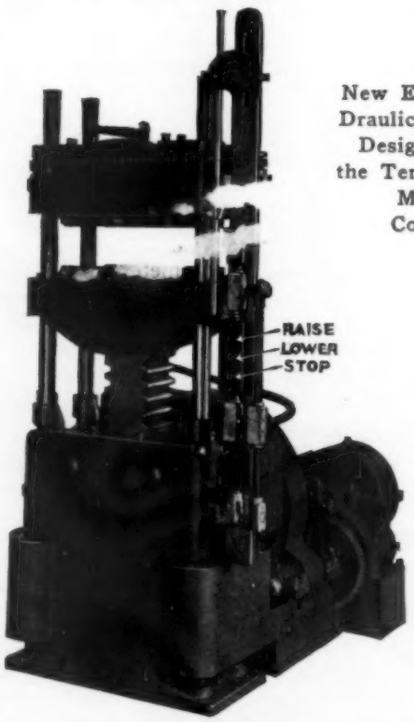
A NEW style of press for the molding of mechanical rubber goods, pyroxylin plastics, casein, fibre and all other synthetic plastics, has been recently placed on the market. The press has been developed by the Terkelson Machine Company, 326 A street, Boston, Mass.

This is an absolute mechanical press, electrically driven and electrically controlled by push button, reversing and limit switches. This outstanding feature eliminates the necessity of hydraulic pressure and expensive hydraulic accessories. Greater production, less spoilage, lower operating costs, and negligible maintenance costs are a few of the advantages claimed by the manufacturers, with the use of this equipment.

The press is unusually easy to operate. It is started in motion by simply pressing the proper button. When the press has reached the end of the stroke, the motor is automatically stopped by means of a limit switch. The motor is used only to open and close the press. On the pressure stroke, four heavy coil springs are compressed which act as an accumulator and which maintains constant pressure and the desired "follow-up" necessary in this type of molding. During the curing period the motor is not running.

Hand molds may be used or each half may be attached to the platens making the press semi-automatic. Extraction or opening force is equal to the closing force, due to the nature of the design. Timing devices for any particular requirements may be installed on the press thereby making it practically automatic in operation. This feature enables one operator to handle more than one press.

Each press being a complete molding unit, valuable space occupied by pumps and similar equipment may be utilized to better advantage. These presses may be obtained for any tonnage, number of openings, size of platens and stroke.



New Electro-Draulic Press Designed by the Terkelson Machine Company

Schaphorst's CHATS *with the* ENGINEER

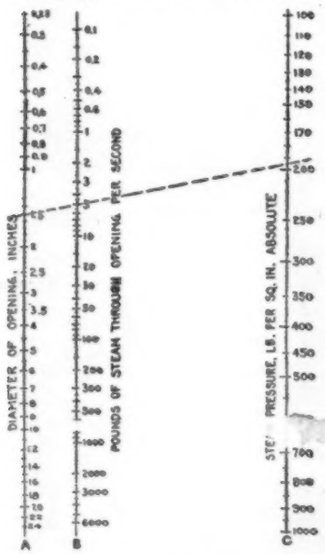
By **W. F. SCHAPHORST, M.E.**

A Useful Steam Chart

THIS simple chart will be found of value for making calculations regarding the steam flow, steam pressure, and diameter of opening or diameter of short pipe for a given condition in the rubber plant where there is at least 60 per cent pressure drop through the opening.

For example, if you carry steam at a pressure of 195 lbs. per square inch absolute, and you figure that it will take 5 lbs. of steam per second to handle a given vulcanizing job or to heat a certain building, the question "What must be the diameter of opening or short pipe to permit 5 lbs. of steam to pass into the machine or heating coils per second?"

A heating problem is a good one to use because it usually involves considerable pressure drop. Very often the pressure drop is affected through a reducing valve. Where a reducing valve is used this chart comes in handy for determining the size of valve required. In other words, the opening through the reducing valve must be large enough to conduct 5 lbs. of steam from the boiler into the machine or heating coils per second.



The dotted line which I have drawn across the chart shows how easily these problems are solved. Simply run a straight line through 195 lbs. per sq. in. (Column C) and then through the 5 lbs. steam per second (Column B) and the answer is 1.5 inches, (Column A). That is, the diameter of opening, orifice, or short pipe, whatever you wish to call it, must be at least one and one half inches. Isn't that easy enough?

There are many other places where this simple chart will come in handy. For instance, if you have a soot cleaner on your boiler the chart will tell you the number of pounds of steam being used per second by the cleaner in cleaning the boiler tubes. If you burn oil and use a steam jet burner it will give you the number of pounds of steam per second used by the burner, knowing the steam pressure and the diameter of opening. If there is a hole in a pipe, fitting or elsewhere, and steam is leaking out into the atmosphere, the chart will instantly tell you the number of pounds of steam that are lost per second and will enable you to quickly compute the loss in dollars per day, week, month, or year. Steam leaks usually are surprisingly expensive. It will tell you the size of safety valve to use. And so on indefinitely.

Inversely you can determine the steam pressure that will be required to force any given number of pounds of steam through any given opening from ¼" diameter to 24" in diameter. In other words knowing any two factors in any of the three columns you can immediately determine the unknown factor in the third column. Pressures, as you will note, range all the way from 100 to 1000 pounds per square inch absolute.

To convert absolute steam pressure into "gauge pressure," simply subtract 15 lbs. from the figures in Column C. Thus, 195 lbs. absolute is equal to 180 lbs. gauge. 250 lbs. absolute is equal to 235 lbs. gauge, and so forth.

Compounding and Tread Weighing Scale

THE Stimpson Computing Scale Company, Louisville, Ky., is introducing a scale especially designed for compounding and tread weighing. Model 110, as the new scale is known, has an electrically illuminated chart with a soft and indirect green light. The use of a lens over the chart provides a magnified indication which is easily read. The indicator has an apparent movement of 3/16" to an ounce.

The mechanism is protected from dust by felt packings and by dustcaps at the openings in the housing under the

beams. The capacity steel beams of 50 lbs. themselves are marked by 2 lb. notches on the bottom rather than on the top to prevent dust settling in the notches and to avoid wear when the poise is moved. The hardened steel dog in the special poise is disengaged from notches by merely pressing lever against side. A 2 lb. steel beam is graduated by 1/100ths lb. and equipped with a poise that does not "walk" when tightened. A 20 lb. tare beam with automatic stop at "0" is also equipped with a locking balance ball to bring the scale quickly to balance at any time.

The platform is of heavy gage steel, mounted on a four point, full floating lever system, with main self-aligning agate bearings mounted in inverted position to prevent dust from settling around the hardened knife edge pivots. The platform size is approximately 18 by 18 inches. The counter space is 22 by 22 inches, and the height to reading line 30⅝ inches.

The Stimpson Computing Scale Company is represented at Akron by E. E. Sandels, of 812 Work Drive.

EDITORIAL COMMENT

THE many activities of the Bureau of Standards in matters pertaining directly to the rubber industry have never been fully appreciated. These activities have been divided between work in connection with the inspection and testing of supplies purchased by the various government agencies, the preparation of specifications, the development of laboratory equipment and methods of tests, investigations relative to the physical, electrical and chemical properties of rubber and rubber products, and experimental work involved in a study of the design and performance of automobile tires.

Activities of the Bureau of Standards

This work had its beginning in 1908 when investigations were undertaken in connection with the inspection of certain Government supplies.

The large quantities of rubber goods required by the engineering forces in constructing the Panama Canal were purchased in accordance with the results of tests made at the Bureau of Standards.

For several years past a great deal of effort has been devoted by the Rubber Section of the Bureau to experimental work required in the development of Federal specifications for various rubber products, such as automobile tires, footwear, hose, packings, and rubber medical supplies. A total of 90 of these specifications have been compiled.

The design of an automobile tire presents an intricate engineering problem and the various details of construction have a distinct bearing upon the performance of a tire on the road. The Bureau has conducted extensive investigations dealing with the durability of automobile tires and with the power loss, or energy dissipated as heat, when tires are operated under different conditions of axle load, speed, and inflation pressure.

Other researches have been concerned with the influence of tire design on the fuel consumption of automobiles and of the effect of reclaimed rubber on the wearing quality of tires. The average motorist probably does not realize that in driving on a level road at a normal speed of 25 miles per hour the power consumed in flexing the tires or, as is commonly said, in overcoming their rolling resistance, represents roughly 30 per cent of the power developed by the engine.

These investigations have shown that the energy wasted in the modern cord tires is approximately 25 per cent less than in tires of fabric construction, and that the power loss is very greatly increased by underinflation of the tires. The detailed results of this work have been presented in the technologic publications of the Bureau.

A recent investigation of "guayule" rubber made in cooperation with the Continental-Mexican Rubber Company has shown that, by an improved process of treatment in its preparation, this rubber compares favorably with plantation Hevea rubber.

THE Rubber Division of the Bureau of Foreign and Domestic Commerce, established in August, 1921, has become the governmental center for economic information about rubber and the trade in manufactured rubber products. The Rubber Division was organized as one of the commodity divisions of the Department of Commerce at the instigation of the rubber industry, and it has enjoyed full cooperation and the best counsel from the industry and its various trade association. But still greater cooperation on the part of individual rubber manufacturing companies will rebound to their advantage during 1930, if they will but use the valuable facilities of the Division to the utmost. In particular, its facilities may help in finding distribution abroad for present high inventories.

Governmental Aid In Exporting

The division serves as the connecting link between rubber trading and manufacturing interests and those Government departments which have occasional need of establishing contact with the industry.

The crude rubber activities of the rubber division have helped to correct popular misunderstanding of the rubber situation by furnishing official data to rubber manufacturers, importers, dealers, and brokers. The division circulates official information concerning United States rubber imports and reexports, world rubber production, consumption and stocks, rubber production possibilities and acreage planted with rubber throughout the world, and other current news affecting world trade in the commodity.

The Crude Rubber News Letter of the division has proved to be a popular service as evidenced by the distribution of about 1,000 copies of each issue.

Through this and similar circulars, trade statistics, reviews of market developments, and current news items are made promptly available to the public.

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

NEWS of the INDUSTRY

Financial—Business
Building Operations
Personals
New Products

LEE RUBBER EARNINGS ARE $485,930 IN 1929

Showing one of the best financial reports for the period for companies of its size, the Lee Rubber & Tire Corporation has announced net profit for the year ended October 31, 1929, as $485,930, after depreciation and reserves, equal to $1.61 a share on the 300,000 outstanding shares of common stock. This compares with earnings of $165,764 in the previous year, equal to 55 cents a share.

The net current assets have been increased by $455,720, making the net working capital $4,382,093. During the fiscal year $121,097 has been invested in plant and equipment and $230,101 has been spent in plant maintenance to keep the company's factories in a high state of efficiency. The financial condition of the company has been strengthened by having the entire earnings carried to surplus account.

"The generally steady market for crude rubber during the year," says John J. Watson, president, "has been an advantage to our manufacturing department and has enabled us to operate on a more uniform basis. There has been some falling off in the demand for tires during the last few months which has affected the volume of sales, but as the company does practically no manufacturers' equipment business, the tire sales being largely confined to the renewal and replacement field, the company should not be seriously affected."

The consolidated income account for the year ended October 31, 1929, compares with the previous year as follows:

	Year end. Oct. 31, 29	Year end. Oct. 31, '28
Net sales	$10,586,785	$11,032,914
Expenses, depreciation, etc.	10,060,773	10,845,805
Operating profits	$526,012	$187,109
Other income	75,536	111,249
Total income	$601,548	$298,358
Interest	115,618	132,594
Net profits	$485,930	$165,764

ADMIRAL TIRE COMPANY LIQUIDATION IS PLANNED

The Coshocton National Bank, which was appointed as receiver for the Admiral Tire & Rubber Company, Coshocton, O., has announced that the plant of that firm will be liquidated to satisfy creditors.

All persons holding bonds or claims against the company are directed to file such claims and deposit such bonds with proper affidavits in support thereof with the Coshocton National Bank on or before January 15.

Odell & Sons Move

Odell & Sons, members of the Rubber Exchange of New York, moved on January 1 to 25 Broad street, New York City. They were previously located at 65 Beaver street in the same city.

Ohio Rubber Company Dinner

Fifty members of the office force and foremen's staff of the Ohio Rubber Company, Willoughby, O., enjoyed a venison dinner on the evening of December 18 at the Kandle-Lite Inn in that city. The affair was an annual one, similar banquets having been held for several years past.

Merrimac Men at Monsanto

Twenty-eight executives of the Merrimac Chemical Company, Inc., Boston, Mass., were guests of the Monsanto Chemical Works in St. Louis, Mo., on December 21. A dinner, attended by 127, was given in their honor at the Missouri Athletic Association. The Merrimac Chemical Company, Inc., is a division of the Monsanto Chemical Works, the union of the two companies having been completed in November.

R. & H. Plant Additions

The Roessler & Hasslacher Chemical Company has completed plans for two additions to its plant at Niagara Falls, N. Y., to be situated on Adams Avenue, near Aluminum Road, in that city. Each will be one story in height and will cost approximately $40,000, including equipment. The company also has filed plans for the construction of a small addition, 45 by 50 feet in size, to its plant at Perth Amboy, N. J., to be used for general operating and distributing service.

To Standardize Rubber Balls

Manufacturers of rubber balls convened in New York City early in December to consider the application of simplified practice to this commodity. The meeting was held in conjunction with the annual meeting of the Toy Manufacturers of the United States of America. Discussion of the problem confronting the manufacturers of toy balls disclosed the fact that the industry was suffering from excess variety in sizes of balls, and that a simplification program could be adopted with benefit to all concerned. A manufacturers' committee is collecting the necessary facts upon which to base a program and a date for a conference has been set.

RUBBER MEN ACTIVE IN OHIO SAFETY CONGRESS

There will be two half-day sessions for the Rubber Section at the annual All-Ohio Safety Congress to be held at Columbus on January 14, 15 and 16. At an afternoon session on January 14, T. B. Farrington, general manager of the factory service division of the B. F. Goodrich Company, will talk on "The Management Side of Safety." F. B. Martens, of the Ohio Industrial Commission, will present "Safety Kinks in the Rubber Industry," showing stereopticon slides.

Dean Fred E. Ayer of the Akron University College of Engineering and Commerce will talk on "Human Engineering" at a session on the final day of the conference. W. L. Schneider, of the B. F. Goodrich Company, will speak on "Safety in the Laboratory." Other speakers will be A. P. Regal, of the Philadelphia Rubber Works Company, with a discussion of reclaiming hazards; S. Mansfield, of the Goodyear Tire & Rubber Company, with a talk on "Safety at Goodyear Yesterday and Today," illustrated by motion pictures; and C. L. Hungerford, of the Firestone Tire & Rubber Company, speaking on conveyors.

J. T. Kidney, of the Goodyear Tire & Rubber Company, will act as chairman of the Rubber Section committee and will be assisted by Mr. Hungerford, Mr. Schneider, Mr. Regal, Mr. H. W. Low, of the Miller Rubber Company, and J. J. Loge, of the General Tire & Rubber Company.

PHARIS TIRE & RUBBER COMPLETES EXPANSION

The Pharis Tire & Rubber Company, Newark, O., has completed a plant expansion program involving the erection of a new warehouse with a capacity of 100,000 tires, an addition to its power plant, a complete renovation of one factory building, and the installation of new equipment, including a molded tube department. The cost of the expansion program was approximately $350,000.

The company, which now has a capacity of about 5,300 tires and tubes daily, is adding a new competitively-priced line of casings to its standard brands.

Form Ewing Rubber Co.

The Ewing Rubber Company, Trenton, N. J., has been incorporated with a capital of $100,000, divided into 1,000 shares of $100 each, to manufacture rubber goods, toys, novelties and druggists' sundries. The incorporators are Walter Plate, Jersey City, N. J.; Laura Henderson, Flushing, New York City; and George Kloch, Jersey City, N. J.

GOODYEAR TEST TRUCKS DRIVEN TO CALIFORNIA

The Goodyear Tire & Rubber Company now has a test force making headquarters in El Centro, Cal., the crew being scheduled to remain there until May. The crew has two test trucks, one a Mack chassis designed for a 40-passenger bus, and the other a White two-ton truck. The trucks, equipped with various weights, will make continuous 24-hour trips between El Centro and Gila Bend, Ariz., and El Centro and Redlands, every day except Sunday.

Tire experts accompany the road crew and will compile extensive data on the condition of the tires. As a rule, the trucks will keep to the main highways, but on occasions will take to side roads and to the desert where no road exists in order to put the tires to the most severe tests.

William W. Weitling

William W. Weitling, former chairman of the board of the American Hard Rubber Company, died unexpectedly at Fort Meade, Fla., on December 16. He was 74 years old. Mr. Weitling, whose home was in College Point, N. Y., had been in the rubber business for more than 55 years.

Born in New York City in 1855, he became secretary of the American Hard Rubber Company in 1897 and was promoted successively to vice-president and to chairman of the board of directors. Following his retirement from active business, he retained directorship in the company. He was also a director of the Pequanoc Rubber Company and a trustee of the College Point Savings Bank.

Mr. Weitling was a member of many scientific and civic organizations. He was an honorary regent of the Lincoln Endowment Association, a founder of the Lincoln Farm Association and president of the Conrad Poppenhusen Association, an endowed free educational institution at College Point. He was a member of the American Museum of Natural History, the Metropolitan Museum of Art, the National Sculpture Society, the Academy of Political Science, the National Geographic Society, the American Association for the Advancement of Science, the Authors' League of America, the Audubon Society, the New York Zoological Society and the Art Alliance of America. He was twice married. His second wife, Mrs. Blanche Selleck Weitling, survives.

CATALPO

for

Treads

Edward A. Andersen

Edward A. Andersen, president and general manager of the Rubber Regenerating Company, Naugatuck, Conn., died of heart disease aboard a New York Central train on December 20 between Harmon and New York City. Mr. Andersen, who was 57 years old, had boarded the train the night before in Cleveland and was returning to his home at Naugatuck.

Born in Chicago on July 14, 1872, Mr. Andersen started as a mill man in the old plant of the Rubber Regenerating Company in that city on March 1, 1900. His factory career was marked by steady progress, his first promotion being to the position of

E. A. ANDERSEN

foreman. He went up then to be assistant superintendent and then superintendent of the Rubber Regenerating factory at Mishawaka, Ind.

On July 1, 1915, he was made vice-president and assistant general manager of the Rubber Regenerating Company, and July 1, 1919, was appointed president and general manager and thereby put in charge of all rubber reclaiming activities of the United States Rubber Company. Mr. Andersen had been a member of the Rubber Association of America until last year and served on the executive committee of the rubber reclaimers division of that body.

E. H. Pearson

E. H. Pearson, New York district manager of the Electric Machinery Manufacturing Company, died suddenly on the morning of December 7. Born in Malmo, Sweden, on September 10, 1893, he spent his early life in that country and received some of his technical education at the Institute of Technology in Malmo. He had been associated with the Electric Machinery Manufacturing Company since 1916.

Nagle Appoints Akron Agent

The Nagle Machine Company, Erie, Pa., manufacturer of rubber working machinery, has announced the appointment of J. C. Clinefelter as sales representative in the Akron district. Mr. Clinefelter was formerly associated with the Akron Rubber Mold Company, which was consolidated into the National Rubber Machinery Company, and he is well known through the Akron territory. His offices will be at 305 Metropolitan Building in that city.

AKRON RECLAIMING CO. OMITS ITS DIVIDENDS

Because its surplus had been reduced after paying dividends greater than the past year's earnings, the Akron Rubber Reclaiming Company, Akron, O., has suspended further disbursements to stockholders. This was revealed last month in a letter to shareholders from J. B. Huber, president of the firm, in which he pointed out the reduction of the surplus to $180,380, after paying dividends of $40,882 during the year closing October 31. Net income for the year was $10,296.

"While profits appear unsatisfactory," said Mr. Huber in his letter, "the directors feel that the company came through an extremely difficult year with marked credit. We maintained the volume in pounds of the preceding year, which we believe creditable in view of the reduced operations in recent months. These conditions have caused a highly competitive market in reclaimed products, and we have suffered reduced profits. As a result, current dividends have been suspended."

Foote Brothers Business Up

Foote Brothers Gear & Machine Company's November business exceeded that of any previous month in 1929 and December business ran equally strong, according to W. C. Davis, president. Mr. Davis said, "Redoubling sales efforts in what otherwise might be a slack period and anticipating needs of customers were responsible for increased business."

Rubber Stocks at New Lows

Securities of leading rubber manufacturing companies closed 1929 at or near their lowest points for the year in most cases. During the last two weeks in December, 11 new lows were registered by rubber company stocks, including Ajax, Goodrich, Kelly-Springfield, Mohawk, Seiberling and Firestone. The year saw rubber company issues open at high prices, make new peaks in the first quarter and then steadily decline to the low levels of November and December. Price quotations on January 4 and the high and low figures for 1929 are as follows:

	Last Price		High	Low
	Jan. 4	Dec. 18	—1929—	
Ajax	1¾	1⅞	11¼	1
Falls	—	—	11⅜	4
Faultless	—	—	45	30
Firestone	30	32⅞	41½	24½
do. 6% pfd.	86	84⅞	98¾	79
Fisk	3½	3½	20⅛	2⅛
do. 1st pfd.	14¼	15	72½	8
General	—	220	298	220
do. pfd.	88½	90	102	88½
Goodrich	43½	46⅝	105¾	38¼
do. pfd.	95⅝	—	115½	95½
Goodyear Com.	65	69⅜	154½	60
do. pr. pfd.	90⅛	95	104⅞	87
India	—	16½	73	16½
Intercontinental	5¼	5	14¼	2
Kelly Springfield	3⅞	4	24	3
do. 6% pfd.	32	21	100	26
Lee	6¼	6⅝	25	5
Miller	4¼	4	28¾	3¼
do. pfd.	18	19½	83	13½
Mohawk	8¾	10	66	7½
do. pfd.	—	—	90½	78
Norwalk	1	—	6⅛	¾
Pirelli	46⅜	45¾	68	43
Raybestos-Manhattan	33½	33⅛	58½	28
Seiberling	10¼	11⅛	65	9
do. pfd.	—	71½	107⅞	71⅞
U. S. Rubber	26⅜	27¾	63	15
do. pfd.	52	51	92½	40¼

MURRAY RUBBER COMPANY STRIKE QUICKLY SETTLED

A strike of about 200 employees of the Murray Rubber Company, Trenton, N. J., has been settled after the men had been out for two days and the workers have returned to the plant. The strike resulted from the importation of 24 tire makers and labor supervisors from Akron, O. The Trenton workmen resented the hiring of the "outsiders" as a menace to their jobs, and the whole working force of the factory was prepared to walk out. More than 200 workmen left their jobs. A conference was held and the plant officials agreed not to hire any more outside labor.

Alfred H. Branham, vice-president of the company and representative of Caldwell & Company, Nashville, Tenn., bankers who are financing a chain store project of the Murray firm, said that the strike will not be held against the men and that all have been reemployed. He added that a number of the men laid off in past weeks will be rehired when production warrants. The men imported from Akron will be laid off shortly.

Vice-President Branham said the Akron men were taken on for the purpose of cutting costs. He said the Murray firm wanted to study the methods of other manufacturers. Efficiency engineers have been at work in the plant endeavoring to cut production costs and the importation of the Akron men was in line with that scheme.

FISK FLAP TUBE PLANT SOLD TO SATISFY CLAIM

The Fidelity Industrial Corporation, formerly the Fisk Flap Tube Company, of Yardville, N. J., was sold on December 18 at a sheriff's sale at Trenton, N. J., to satisfy a claim of nearly $40,000. The claim was held by Michael Gilinsky and Hyman Rosenthal, president of the Near Para Rubber Company, Trenton, N. J.

The price paid at the sheriff's sale was $1,000, and no indication was given as to what disposition will be made of the property. William J. Connor was appointed receiver of the company by Chancellor Walker, but the Chancery Court later removed the property from the receiver's hands. Some years ago Mr. Gilinsky and Mr. Rosenthal sold the plant to the Fisk Flap Tube Rubber Company, organized by C. Francis Fisk who patented a new type of inner tube.

To Expand Grasselli Plant

The Grasselli Chemical Company, Cleveland, O., a subsidiary of E. I. du Pont de Nemours & Company, has announced further details of its expansion and improvement program at its plant at Grasselli, N. J. A number of new units will be constructed and additional equipment will be installed for a large increase in the company's present output of rubber and other chemicals. The cost of this extension will be in excess of $1,000,000, including machinery, and the company will also carry out expansions of other plants early this year, details of which will soon be arranged, at an estimated cost of upward of $1,500,000.

E. W. BeSAW

J. W. THOMAS

Firestone Appoints Executives To Higher Company Positions

DIRECTORS of the Firestone Tire & Rubber Company on December 16 completed a number of promotions started by the stockholders at their annual meeting held earlier in the day. They elevated Vice-President John W. Thomas to the post of general manager of the company and elected Lee R. Jackson, formerly general sales manager, to the post of vice-president in charge of sales. Mr. Jackson had previously been elected a director at the stockholders' meeting.

L. R. JACKSON

B. M. Robinson, assistant secretary of the company, was also elected to the board of directors. Earl W. BeSaw, of Hamilton, Ont., where for years he has been connected with the Firestone Tire & Rubber Company's Canadian subsidiary, was appointed president of Firestone Canadian, Ltd., by the directors of that organization.

Mr. Thomas has been with the Firestone organization since completing his course at Buchtel College in 1908. Employed first in the chemical laboratory, he was made factory foreman 18 months later and from that time on his connection with Firestone has been a long series of promotions. He became a vice-president in 1919 and the recent board action gave him the additional title of general manager.

Mr. Jackson, also a graduate of Buchtel College (now Akron University), first joined Firestone at a salary of $60 a month. After working in several sales positions and branch managerships, he was made Pacific Coast manager in charge of sales and in 1927 sales manager of the entire company.

A graduate of the University of Indiana, Mr. Robinson has been with the Firestone Company for more than 10 years. He served as prosecuting attorney at Brazil, Ind., before coming to Akron to work in the legal department of the Firestone Company. Later he was promoted to the post of assistant secretary.

Mr. BeSaw became a salesman for Firestone 20 years ago and was promoted successively to Des Moines branch manager, western district manager, manager of western sales, and general sales manager of the Firestone Company. He became vice-president of the Oldfield Company, predecessor of Firestone Canadian, Ltd., and has held the same post with the latter organization since its formation in 1922. He is a former president of Rubber Association of Canada.

Budd Adopts Goodyear Rims

The type "K" rims of the Goodyear Tire & Rubber Company for mounting large pneumatic bus and truck tires have been adopted as standard equipment on Budd wheels, according to a Goodyear announcement last month. This type of rim has been tested through more than three years of service under difficult conditions.

Names in the News

HARVEY S. FIRESTONE, president of the Firestone Tire & Rubber Company, celebrated his 61st birthday on December 20 and left Akron on his annual trip to Miami Beach, Fla. On Christmas Day he went with HENRY FORD and THOMAS A. EDISON to call on JOHN D. ROCKEFELLER at his home at Ormond Beach, Fla.

R. E. LEE, general foreman, and B. DARROW, manager development department of the Goodyear Tire & Rubber Company, returned to Akron last month after a visit to the Goodyear plant at Sydney, Australia.

STANLEY HARRIS, president of the National Rubber Machinery Company, and a party of associates from Akron, including C. P. LEGUILLON, P. H. MAYNES and PAUL A. FRANK, were dinner guests of E. T. COYLE on December 18 at the Park House, Columbiana, O.

DR. E. H. GRAFTON, technical superintendent of the C. Kenyon Company, Inc., and the Vulcan Proofing Company, Brooklyn, N. Y., since June, 1928, has resigned to assume charge of the chemical development department of the American Salpa Corporation, 261 Fifth Avenue, New York City, producers of a new secret process leather. The major portion of his time, however, will be spent at the company's factory at Spotswood, N. J. Dr. Grafton was technical superintendent of the Murray Rubber Company, Trenton, N. J., for two and a half years before joining the Kenyon company, and before that time held a similar position with the Quaker City Rubber Company, Philadelphia, Pa.

WILLIAM DEKRAFFT, who has been for many years associated with the Baldwin Locomotive Works as vice-president in charge of finance, assumed the duties of chairman of the finance committee of the United States Rubber Company on January 1. He has been a member of the board of directors of the company for some time.

COMMANDER CHARLES BELKNAP and PHILIP STOCKTON were added to the board of the Monsanto Chemical Works, St. Louis, Mo., at the meeting of the directors on December 27. Commander Belknap, president of the Merrimac Chemical Company, Inc., recently acquired by Monsanto, was director of the Naval Overseas Transport at Washington during the world war. Mr. Stockton is president of the First National Bank of Boston, and, in addition, is a member of the boards of directors of the American Telephone & Telegraph Company, General Electric Company, and other companies.

WALTER T. SCOTT, of the Lambertville Rubber Company, Lambertville, N. J., has returned from a business trip through the middle western states.

PARKS NAMED HEAD OF UNITED CARBON RESEARCH

Charles R. Parks, formerly of the Goodyear Tire & Rubber Company, has been appointed as head of the research laboratory of the United Carbon Company. Mr. Parks has spent six years in the rubber industry and in that time has become well known through a number of papers he has published, some of them jointly with other research men. These papers have dealt with the structure and physical properties of rubber, accelerated ageing tests, the effect of heat on raw rubber and the use of carbon black as a reenforcing agent.

C. R. PARKS

Born at Tiffin, O., in 1894, Mr. Parks was graduated from Cornell University in 1916 and taught inorganic chemistry in the following year at the University of Minnesota. From 1917 to 1923, he taught inorganic chemistry and physical chemistry at the Massachusetts Institute of Technology. During the three years to 1926, he was associated with the Goodyear Tire & Rubber Company in general plant control, development work in compounding, and special work on compounding materials in the research division.

Mr. Parks went to Los Angeles in 1926 where he organized a general chemical and rubber testing laboratory and assisted in the development of the production and use of Goodwin black. During part of 1928 and 1929 he was in charge of compounding research at the Akron plant of the Goodyear Tire & Rubber Company.

A. H. LEWIS, southwestern tire sales manager of the United States Rubber Company, recently visited Wichita, Kan., as a part of a trip through the southwest territory to survey general conditions and outline plans for 1930 to distributors. He was accompanied by H. A. HOLMES, Kansas City district manager.

F. E. DENNY, of the Boyce Thompson Institute, was a speaker before the meeting of Akron Section of the American Chemical Society on January 9.

BARRY V. CORNWALL has entered the Dyestuffs Technical Laboratory of E. I. du Pont de Nemours & Company at Wilmington, Del. G. E. FAULKENBERRY has accepted a position with the dyestuffs division of the company at Charlotte, N. C.

W. C. YOUNG, manager of the aeronautical division of the Goodyear Tire & Rubber Company, will speak on January 15 at a dinner meeting of the Inter-Club Council of Hamilton, O. Mr. Young will address the meeting under the auspices of the Rotary Club of Hamilton.

JAMES D. TEW, president of the B. F. Goodrich Company, on December 13 addressed a group of 30 Kansans, including 25 of the leading farmers of the state, who toured the rubber factories of Akron under the auspices of the Capper farm publications. G. A. WADDLE, assistant sales manager of the Goodyear-Zeppelin Corporation, addressed the party when they visited the airship dock at the municipal airport. They were also shown over the plant of the Firestone Tire & Rubber Company and the model dairy farm of the Firestone estate.

C. W. SEIBERLING, vice-president and treasurer of the Seiberling Rubber Company, has been appointed as one of the five new directors of the Akron Better Business Commission. He will serve three years, his term expiring December 31, 1932.

P. S. SHOAFF, of the crude rubber division of the Goodyear Tire & Rubber Company, has returned to Akron after seven months in the Far East where he made a study of production. Sailing from San Francisco in April, he visited the Wingfoot and Dolok Merangir plantations of the Goodyear company and returned by way of Egypt and Europe.

DR. W. A. GIBBONS, of Montclair, N. J., has been appointed as director of the development department of the United States Rubber Company. In his new post he assumes charge of all research work. Dr. Gibbons has been associated with the United States Rubber Company for several years and was the first chairman of the New York Group of the Rubber Division of the American Chemical Society.

STANLEY KRALL, of the Fisk Rubber Company, Chicopee Falls, Mass., has been selected to serve on the chemical engineering committee of the Chicago Century of Progress celebration in 1933. Mr. Krall is chairman of the Rubber Division of the American Chemical Society.

Rubber Goods and Specialties

Firestone Friction Tape

Marketed in an attractive orange and blue container, Firestone Holdfast friction tape is intended for the automotive trade, the electrical trade and for all industrial users. The cotton sheeting, according to the manufacturer, must show straight threads, firm weave, freedom from dirt, lumps, knots and other irregularities. The rubber compound

resists age and the penetration of electric current. It is not affected by freezing, and, applied quickly and easily, it forms a practically one-piece insulating jacket, proof against water, dust, oil, heat and cold. The manufacturer is the Firestone Tire & Rubber Company, Firestone Park, Akron, O.

Markus Life-Saving Vest

Under the name of the Markus Self-Inflating Life-Saving Vest, Markus Devices, Inc., Kansas City, Mo., is manufacturing a garment that will float the wearer on his back and support his head well above the water. The inflating mechanism consists of a chamber, chamber cap, charged pressure tube and discharge lever, and a single jerk on the latter will cause the vest to be com-

pletely inflated by the compressed gas in the pressure tube. The material of the garment is of Airubber fabric, inside rubberized strong olive drab jean, complete vulcanized. It is easy and convenient to wear while out of the water.

Rubber-All Waterproof Suit

Made for all outdoors and utility purposes, this garment is formed of a double texture cloth with a sheet of pure rubber between layers, making it absolutely waterproof. The collar is convertible into a hood which protects the neck and head, and there are no buttons or hooks to tear off. A talon hookless fastener opens or closes the suit quickly by pulling the slider. Two-piece suits are made as well as single garments by the manufacturer, the Rubber-All Company, 35 West 25th Street, New York City.

Pneumatic Tire Shield

A pneumatic tire shield has been invented by J. Ricketts, of Victoria, Australia, and is claimed to be a valuable aid in preventing punctures. The shield is made of compressed fiber or rubberized leather, with its outer periphery curved and covered with rubber. It is inserted between the cover and the inner tube, a flexible rubber band being located between the shield and the inner tube in order to prevent pinching.

New Umbrella Stand

At the London Motor Show there was exhibited an umbrella stand with a waterproof cellulose lining, at the base of which is a detachable metal cup fitted with absorbent sponge rubber. This absorbs the drips from a wet umbrella and also prevents any rattling noise. The stand is made in all popular colors, including green, wine and blue.

New Syphon Tray

A new tray stand for syphons, introduced in England, is made of Bakelite with a powerful rubber suction cup which forms a vacuum to hold the syphon securely in position. While intended primarily to catch the drippings from the syphon, the tray may be used as a stand for pickle, cream, preserve and other jars.

Rubber-Mounted Toggle Switch

Cutler-Hammer, Inc., 1286 St. Paul Avenue, Milwaukee, Wis., has added to its line a rubber-mounted enclosed toggle switch.

The C-H 7281 switch, as it is known, has its entire mechanism resting on soft rubber pads and is, therefore, wholly silent in use. The absence of screws to hold the switch mechanism prevents the transfer of jar, vibration and noise to button and outside of switch and reduces noise to a minimum. The contact blade is heavy phosphor-bronze and the body and cover are of Thermoplax, a cold molded insulating material. The new switch is said to fit all boxes and to work equally well with all plates. It is furnished in single pole, double pole, three-way and four-way types.

Largest Balloon Truck Tire

The largest balloon truck tire ever constructed is shown at the right just after it had come from the molds of the Akron plant of the Goodyear Tire & Rubber Company. The size of the casing is 13.50-20, and it is the first of a set of 10 to be used by the Texas Electric Service Company, Dallas, Tex., on a Model A P Mack six-wheel truck and a four-wheel highway trailer. The load capacity of 13.50-20 tires is 8,800 pounds, and the recommended air pressure is 95 pounds. The Goodyear company has started production of these casings and will have them available as a regular stock product in the future. R. S. Wilson, sales manager (right), and C. C. Slusser, factory manager (left), are shown making a personal inspection of the first of the new tires.

Current Crude Rubber Items

DUTCH PLANTER SUGGESTS PLAN FOR RESTRICTION

In connection with the crisis at present existing in the rubber producing industry, Herr Roelesema, a member of the board of the Tapanoeli Company of Rotterdam, has addressed an open letter to the Dutch Minister for the Colonies. In the course of his letter, which has just been published by the "Handelsblad," Herr Roelesema makes the following recommendations:

(1) The prohibition of the extension of European and native plantations;

(2) The prohibition of rubber tapping on Sundays (in Mohammedan districts on Fridays);

(3) The retention of the lower grades of rubber from European enterprises by mutual "Gentleman's Agreement."

Finaliy, the writer of the letter explains at length that, in his opinion, government intervention alone might safeguard rubber cultivation and he, therefore, recommends cooperation between the British and Dutch Governments and producers.

Batu Tiga Rubber Issue

The board of the Batu Tiga (Selangor) Rubber Company, to meet capital expenditure incurred and to be incurred and for general purposes, has decided to create and issue £25,000 7 per cent convertible ten-year debenture stock, reserving power to create a further £50,000 in the event of the company acquiring further estates. The subscription of the stock now offered has been guaranteed in consideration of an underwriting commission of 2½ per cent and an overriding commission of ½ per cent in a contract made with the Selected Investment Trust.

Form Hevea Rubber Trust

Particulars have been filed of £25,000 debenture stock and premium of 5 per cent authorized September 18 and covered by trust deed dated November 15, 1929, of the Hevea Rubber Trust, Ltd., charged on the company's undertaking and property, present and future, including uncalled capital, the whole amount being now issued. The trustees of the company are A. B. Murray and D. F. L. Zorn, both of London, England.

Bekoh Yield Is Higher

The yield of the Bekoh Consolidated Rubber Estates, Ltd., has increased from 567,-049 pounds in 1927-28 under restriction to 1,167,297 pounds in the year ended June 30, 1929. As the company has cultivated only 2,672 acres of the 3,600 acres it owns in Malacca and the Muar district of Johore, the crop is equal to 490 pounds per acre. Instead of costing about 7d per pound, as the board of directors had expected, the crop has been secured at no more than 5d per pound all-in.

K. M. S. Profit Gains

Profit of the K. M. S. (Malay States) Rubber Company for the year ended June 30, 1929, amounted to £26,119 after depreciation, as against £9,578 in the previous year. The rubber harvested amounted to 1,022,599 pounds as compared with 522,922 pounds for the year previous. From July 1 to December 1, 1929, the company reports that it has contracted to deliver 67,200 pounds of rubber at an average price of 1s 8.375d per pound landed London terms. Crop output for the current financial year is estimated at 1,010,-000 pounds.

ADVOCATES SIXTY-DAY STOPPAGE OF TAPPING

Declaring that none of the schemes thus far proposed to improve the rubber price situation provides any real remedy, Clive H. Mears, of London, has suggested a complete cessation of production under the British and Dutch governments for a period of 60 days. "The Rubber Growers' Association scheme," Mr. Mears asserts, "discloses the practical impossibility of organizing any effective central selling. The Dutch scheme would be ineffective because the holding back of small quantities of produce is not a remedy but a very temporary palliative foredoomed to failure, since the rubber held up would still be there and would have to be marketed eventually. Mr. Halford Hewitt's scheme fails to meet the situation because the accumulations thus acquired would always overhang the market and thus discount any rise and lead eventually to deplorable results to those who financed such operations.

"There appears to be only one fundamentally sound solution which will solve the problem—the stoppage of production pro tem. If the British and Dutch governments, backed up by the British and Dutch producers, would get together and arrange to stop all production for a mere 60 days in Ceylon, Malaya, Sumatra and Java, the whole outlook and future would at once reflect a kaleidoscopic change.

"This short and complete stoppage of all British and Dutch production for a mere 60 days would result in the unwanted surplus stock being absorbed without imperilling the normal world working stocks and would give us within 60 days a fair price and a good market for our rubber without any long-drawn-out or complicated scheme which might take a year or two to function."

Closing Prices on Rubber Exchange of New York, Inc.

FROM DECEMBER 18, 1929, TO JANUARY 6, 1930

		Spot	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Sales*
Dec.	18	16.00	16.00	16.20	16.40	16.60	16.90	17.10	17.30	17.50	17.70	17.80	18.00	——	324
	19	15.90	15.90	16.10	16.30	16.50	16.70	16.90	17.10	17.30	17.50	17.60	17.80	——	345
	20	15.70	15.70	15.90	16.20	16.30	16.50	16.70	17.00	17.20	17.50	17.60	17.80	——	323
	21	15.50	15.60	15.80	16.00	16.20	16.50	16.70	16.90	17.10	17.30	17.40	17.60	——	74
	23	15.40	15.40	15.60	15.80	16.00	16.30	16.50	16.80	16.90	17.10	17.30	17.60	——	446
	24	15.50	15.50	15.70	16.00	16.20	16.40	16.60	16.90	17.00	17.20	17.40	17.70	——	160
	26	15.80	15.70	16.00	16.30	16.50	16.70	16.90	17.20	17.30	17.50	17.70	18.00	——	392
	27	15.70	15.60	15.80	16.10	16.30	16.60	16.80	17.00	17.10	17.30	17.50	17.80	——	249
	28	15.70	15.60	15.90	16.20	16.40	16.60	16.80	17.10	17.20	17.40	17.60	17.90	——	33
	30	16.00	15.80	16.10	16.40	16.60	16.80	17.00	17.20	17.40	17.60	17.80	18.00	——	341
	31	16.10	16.00	16.20	16.50	16.70	17.00	17.20	17.40	17.60	17.80	18.00	18.20	——	268
Jan.	2	15.70	15.50	15.70	16.00	16.20	16.40	16.60	16.80	17.00	17.20	17.40	17.60	17.80	361
	3	15.60	15.30	15.50	15.80	16.00	16.20	16.40	16.60	16.80	17.10	17.30	17.50	17.70	384
	4	15.50	15.20	15.40	15.60	15.80	16.10	16.30	16.60	16.80	17.00	17.20	17.40	17.60	186
	6	15.60	15.50	15.60	15.80	16.00	16.20	16.40	16.60	16.80	17.00	17.20	17.40	17.60	509

*In lots of 2½ tons each

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N. J. MANUFACTURERS ELECT NEW OFFICERS

The Rubber Manufacturers' Association of New Jersey held its annual meeting last month at the Trenton Club, Trenton, N. J. A good attendance of members was present and listened to a talk on the general rubber situation by A. L. Viles, general manager of the Rubber Manufacturers' Association, Inc.

Officers were elected by the group for the coming year. The new officers are A. Boyd Cornell, Hamilton Rubber Manufacturing Company, president; L. Eli Reed, Mercer Rubber Company, vice-president; Horace B. Tobin, Woven Steel Hose & Rubber Company, treasurer; and Charles E. Stokes, Jr., Home Rubber Company, secretary.

NEW AERATED RUBBER IS INTRODUCED IN ENGLAND

"Jurant," a new aerated rubber giving greater resilience, yet never getting out of shape, has recently been introduced by R. D. Mennell, Oxford, Eng. It is claimed to be an ideal material as a basis for cushions, and is now being offered in convenient sizes for domestic and office use.

The invention consists of a series of pads connected by bands, tapes, and the like in such a way that they can be adjusted to suit the user, which means for attachment to a chair or stool, and made so that it can be folded up for carrying.

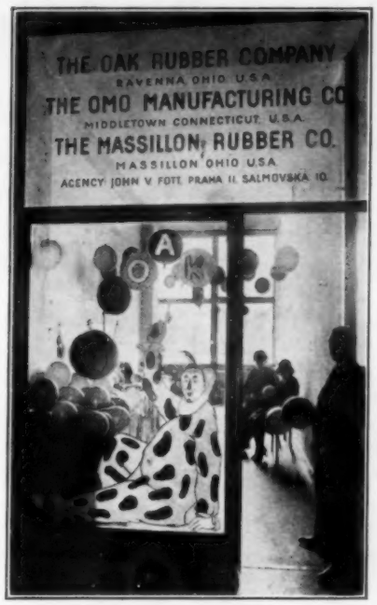
The material offers scope for those who like to make their own Christmas presents, for with remnants of it, useful gifts can be easily made. It opens up a new field for the handicraft worker as a material for filling cushion covers of leather, raffia, hand-woven cloth or other fancy material.

ONE-STOP STATIONS ARE SUCCESS, SAYS FIRESTONE

That the establishment of one-stop master service stores in co-operation with dealers has proved to be very successful is the opinion of Harvey S. Firestone, president of the Firestone Tire & Rubber Company, expressed in a recent statement to stockholders. There are now 200 of these giving standard service on tires, tubes, batteries, gasoline, oil, brake lining, rims and other accessories, he said, and the number will be increased as fast as conditions warrant. "The success of these service stores has convinced us that the car owner appreciates this service and we are sure our investment in them will prove very profitable to our dealers and the company," he declared.

The demand for batteries will require the erection of additional factories at favorable distributing points, Mr. Firestone stated. Other expansions contemplated or under way include the doubling of the Los Angeles tire plant to a capacity of 15,000 tires a day, an addition to the British plant, and an addition to plant No. 2 at Akron. When all are completed, the total Firestone capacity will be raised to 80,000 tires a day. Over 50,000 acres will have been planted to crude rubber in Liberia by the end of the 1930 planting season.

Rubber Goods at Prague Fair



Displays of toy balloons made by the Oak Rubber Company, Ravenna, O., rubber gloves manufactured by the Omo Manufacturing Company, Bridgeport, Conn., and rubber specialties made by the Massilon Rubber Company, Massilon, O., were exhibited in this sales room at the recent Prague Sample Fair in Prague, Czechoslovakia. John V. Fott, the local agent for these products, who maintained the exhibit, is shown standing in the doorway. The export sales of the other two companies are conducted by the export department of the Oak Rubber Company, through whose courtesy the above photograph was obtained.

Schinning & Arve Profits

After several years of depression and financial reverses, the Danish rubber goods factory of Schinning & Arve, Copenhagen, has succeeded in improving its position. A statement covering the past year's activities shows that its earnings amounted to 500,000 crowns, as against 400,000 crowns for the preceding year. A dividend of 6 per cent was paid to the stockholders.

NEW TIRE IS PATENTED BY NORWEGIAN INVENTOR

A Norwegian army officer has patented a new tire, which was presented to the public several weeks ago at a meeting at which the Norwegian king and many public officials were present. A certain amount of secrecy is noticeable in press reports, but the new tire has now had a practical demonstration on one of the Oslo busses and is said to have given satisfactory results.

A Norwegian company is being organized to exploit the patent under the name Fixcerrage, with a capital of 400,000 crowns. Shares are now being offered to the public. A Swedish company is also to be formed with a capital of 2,000,000 crowns, of which the Norwegian company is to have a 51 per cent interest.

INVESTIGATE CONTRACTS FOR NEW JERSEY TIRES

State contracts for automobile tires and tubes came in for attention last month from the Abell audit and finance committee at a hearing in Trenton, N. J. Edward Quigley of Newark, State purchasing agent, was the witness during whose stay on the stand evidence regarding tire contracts was brought out. It developed that Quigley simply passed the bids along to the State House Commission, consisting of the governor, comptroller and state treasurer, and this body instructed him which bid to accept.

Quigley said that the tire and tube contract for 1929 was awarded to the Murray Rubber Company of Trenton on the State House Commission's orders, although neither in actual figures nor on a basis of guaranteed mileage was its bid the lowest of the seventeen submitted. The president of the Murray Rubber Company, C. Edward Murray, is Quartermaster-General of the National Guard.

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Five cents a word, minimum charge $2.00, payable in advance.
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THE RUBBER AGE
250 West 57th St., New York City

SITUATIONS WANTED

SUPERINTENDENT or General Foreman, technical graduate with twelve years' experience in the manufacturing of tires, tubes, heels and soles. Thoroughly competent to take charge of factory or department. Full knowledge of cost, compounds, construction and all factory details. References furnished. Address Box 545, THE RUBBER AGE.

EQUIPMENT FOR SALE

FOR SALE—Complete equipment of the Paru Rubber Manufacturing Company, manufacturers of rubber hygienes for the rubber trade. Write to O. O. Uhle, Executor of the O. C. Hansen Estate, 2505 Magnolia Street, Oakland, California.

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, JANUARY 4, 1930

RUBBER

Crude

THE year 1929 closed with an average price of 20.55 cents a pound for spot ribbed smoked sheets. This was the lowest yearly average price since 1922 and compares with 22.48 cents in 1928, 37.72 cents in 1927, 48.50 cents in 1926 and 72.46 cents in the exceptional year of 1925. During 1922, the average price was 17.50 cents a pound, and the low quotations at that time were responsible for the British government establishing an export restriction act.

The price of crude rubber in the last month of the year was the lowest for the entire twelve months and, in fact, the lowest average price since September, 1922. The quotations for the commodity last month held steady at 16¼ cents a pound for the full first week, rallied upward for a few days as high as 16⅝ cents, and then slowly declined to the year's low of 15½ cents on December 23. The average for the month was 16.12 cents, as compared with 16.62 cents in November.

The main question facing the market with the new year is whether or not Malayan production and exports will continue at the same heavy rate as during 1929. That consumption will be as high or higher seems certain, but the problem of excessive production is considered by some authorities as likely to bother the industry for some years to come.

Prices quoted on the New York outside market on January 4 were as follows

Plantations—			
Ribbed Smoked Sheets—			
Spot-Jan.		.15½@	.15⅝
Feb.-Mar.		.15⅝@	.16⅛
Apr.-June		.16⅛@	.16½
First Latex, crepe spot		.16 @	.16½
Amber Crepe, No. 2		.13⅞@	.14
Amber Crepe, No. 3		.13½@	.13¾
Amber Crepe, No. 4		.13 @	.13¼
Brown Crepe, Clean thin		.13⅜@	.13⅝
Brown Crepe, specky		.13 @	.13⅜
Liquid Latex, per gal.		.90 @	
Paras—			
Up-river Fine		.16 @	.16¼
Up-river Medium		Nominal	
Up-river Coarse		.08¼@	.08½
Acre Bolivian, fine		.16½@	.16¾
Caucho Ball, Upper		.08 @	.08¼
Islands, fine		Nominal	
Centrals—			
Central, scrap		.08¼@	—
Esmeraldas		.08¼@	—
Balata—			
Block, Colombia		Nominal	
Block, Ciudad		.41 @	.42

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Jan.		7⅝@	7¾d
Feb.-Mar.		7¾@	7⅞d
Apr.-June		8 @	8⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot		— @	7⅝d

Scrap

Demand for scrap rubber is now increasing steadily as reclaimers are beginning to start upon heavy production scheduled this year. Prices remained practically unchanged as follows:

(Prices to Consumer)

Auto tire peelings	ton	35.00	@37.50
Standard White auto	ton	45.00	@47.50
Mixed auto	ton	22.50	@23.00
Bicycle tires	ton	18.50	@20.00
Clean solid truck tires	ton	24.00	@25.00
Boots and shoes	cwt.	1.45	@ 1.50
Arctics, untrimmed	lb.	.00⅞@	.01
Inner tubes, No. 1	lb.	.07¾@	.08
Inner tubes, No. 2, compounded	lb.	.04⅛@	.04¼
Inner Tubes, Red	lb.	.04¼@	.04⅜
Air Brake Hose	ton	25.00	@27.50
Rubber Hose	ton	17.50	@20.00

Reclaimed

Reclaimed rubber consumption in the United States during 1929 was practically the same as in 1928 when the actual figure was 223,000 tons. It is, therefore, pretty evident that manufacturers are employing a smaller percentage of reclaim in relation to crude rubber. In 1928 the proportion was 50.4 pounds of reclaim for every 100 pounds of crude, but last year the proportion was only a trifle over 47 pounds to the 100. Prices for the various grades closed the fortnight as follows:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.12 @	.12¼
High Tensile Red	lb.	.11 @	.11½
Shoe			
Unwashed	lb.	.07 @	.07¼
Washed	lb.	.09½@	.10
Tube			
No. 1 (Floating)	lb.	.12 @	.12½
No. 2 (compounded)	lb.	.09½@	.10
Tires			
Black	lb.	.07 @	.07¼
Black, selected tires	lb.	.07¼@	.07½
Dark Gray	lb.	.08⅝@	.09
Light Gray	lb.	.09¾@	.10¼
White	lb.	.11⅛@	.12
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07¼@	.07½
Miscellaneous			
Mechanical blends	lb.	.06½@	.07
Red	lb.	.11¼@	.12

COTTON and FABRICS

Cotton

DURING the year of 1929, the average price for spot middling upland cotton on the New York market was 19.03 cents a pound, as compared with 19.97 cents in 1928 and with 17.49 cents in 1927. The price held firmly for the first four months above 20 cents, the highest monthly average being in April at 20.29 cents, but declined steadily from that point to its low of 17.28 for the month of December.

Quotations during the past fortnight have been fairly stable and closed somewhat higher than at the end of the previous period. High, low and closing prices quoted on the New York Cotton Exchange on January 4 were as follows:

	High	Low Jan. 4	Close	Close Dec. 17
Jan.	17.07	16.95	16.97	16.87
Mar.	17.21	17.10	17.11	17.17
May	17.43	17.34	17.35	——

Tire Fabrics

Fair sales of tire fabrics were reported during the past fortnight with prices slightly lower than at the end of the previous period. Tire manufacturer takings were said to be through the general line of tire fabrics and in quantities which would indicate that spring production of tires is being started progressively.

CORD			
Peeler carded, 23/5/3	lb.	.44¾@	.45
Peeler, carded, 23/4/3	lb.	.46¾@	.47
Peeler, carded, 13/3/3	lb.	.42½@	.42½
Peeler, carded, 15/3/3	lb.	.42¾@	.43
Egyptian, carded, 23/5/3	lb.	.49 @	.49¼
Egyptian, combed, 23/5/3	lb.	.55 @	.55¼
CHAFERS			
Carded, American, 8 oz.	lb.	.37½@	.38½
Carded, American, 10 oz.	lb.	.38½@	.39
Carded, American, 12 oz.	lb.	.38 @	.39
Carded, American, 14 oz.	lb.	.37 @	.43
LENO BREAKER			
Carded, American, 8¼ oz.	lb.	.39 @	.43
Carded, American, 10¼ oz.	lb.	.39 @	.43
SQUARE WOVEN			
Carded, American, 17¼ oz. 23-11 ply	lb.	.44½@	.45½
Carded, American, 17¼ oz. 10-ply	lb.	.37½@	.38½

Sheetings

Sheetings have been fairly active and fractionally lower in price during the past fortnight. Late price quotations were as follows:

40-inch, 2.50-yard	yd.	.11½@	.11¾
40-inch, 2.85-yard	yd.	— @	.10
40-inch, 3.15-yard	yd.	— @	.10⅝
40-inch, 3.60-yard	yd.	.08¾@	.09
40-inch, 3.75-yard	yd.	.08⅛@	.08½
40-inch, 4.25-yard	yd.	.07¼@	.07⅝

Ducks

Better sales were reported for cotton ducks, with prices closing as follows:

Belting and Hose	lb.	— @	.36
Enameling	lb.	.34 @	.36
Single filling	lb.	.14½@	.15½
Double filling	lb.	— @	.17

CHEMICALS

WITH the close of the year 1929, there ended what has been the greatest period of progress for suppliers of rubber chemicals. The consumption of rubber and the amount of manufactured rubber products were at their highest point for all time. Plant expansions were made necessary for many leading chemical manufacturers, and production capacity is now considerably greater than it was at the start of 1929. Mergers in the industry have also been a feature of the past year, with several of the larger companies absorbing smaller ones for greater efficiency and economy. The effects of these changes will be felt during the present year, which seems destined to be at least equally good for the chemical industry.

ACCELERATORS

Organic

A-1	lb.	.24	@	.27
A-5-10	lb.	.33	@	.36
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-20	lb.	.64	@	.68
A-32	lb.	.80	@	.95
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16¼
Captax	lb.	.60	@	.70
Crylene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.44½
Diphenylguanidine	lb.	.30	@	.32½
Dipsol	lb.	4.30	@	4.50
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.37½	@	.40
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.58½	@	.61
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.	.37½	@	.40
Monex	lb.	3.25	@	—
Oxynone	lb.	.68	@	.80
Phenex	lb.	.75	@	—
R & H 40	lb.	.40	@	.42½
R & H 50	lb.	.40	@	.42½
R & H 397	lb.	.75	@	.77½
R-2	lb.	1.95	@	2.15
Safex	lb.	1.20	@	1.25
SPDX	lb.	.75	@	—
Super-Sulphur No. 1	lb.	.50	@	.52
No. 2	lb.	.18	@	.25
Tensilac, No. 39	lb.	.40	@	.42½
Tensilac, No. 41	lb.	.50	@	.52½
Thermlo F	lb.	.50	@	.55
Thiocarbanilid, drums	lb.	.25½	@	.28½
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.62½
Tuads	lb.	3.25	@	3.50
Ureka	lb.	.75	@	1.00
Vulcanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Z 88	lb.	.50	@	.60
Zimate	lb.	4.00	@	5.00

Inorganic

Lead, sublimed blue	lb.	.08¼	@	—
Lead, white	lb.	.08½	@	.08¾
Litharge, domestic	lb.	.09¼	@	.11
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)

Blues

Prussian	lb.	.35	@	.36
Ultramarine	lb.	.06	@	.30

Browns

Sienna, Italian	lb.	.05¼	@	.12½
Umber, Turkey	lb.	.04½	@	.07

Greens

Chrome, light	lb.	.30	@	.32
medium	lb.	.31	@	.33
dark	lb.	.34	@	.36
Chromium Oxide, bbl.	lb.	.34½	@	.35½

Reds

Antimony crimson, 15/17	lb.	.40	@	.44
sulfur, free	lb.	.56	@	.66
golden 15/17 F.S.	lb.	.20	@	.25
Indian English	lb.	.08	@	.11
Domestic (Maroon)	lb.	.11	@	—
Oximony	lb.	.13¼	@	—
Red oxide, pure	lb.	.10	@	.12
Venetian red	lb.	.03	@	.06
Vermillion. quicksilver, English	lb.	2.00	@	2.05

Whites

Lithopone, Akeolith	lb.	.05 3/5	@	.06
Lithopone, Albalith	lb.	.05¼	@	.05¾
Lithopone, Azolith	lb.	.05¼	@	.05¾
Lithopone, Vanolith	lb.	.05¾	@	—
Titanox B, f.o.b. St. Louis,	lb.	.07¼	@	.07¾
Titanox C, f.o.b. St. Louis,	lb.	.07¾	@	.08¼

Zinc Oxide—American Process

American Azo:				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅝	@	.06⅞
Horsehead Brand:				
Special	lb.	.07	@	.07½
XX Green	lb.	.07	@	.07½
XX Red, lead free	lb.	.06½	@	.07
Kadox, black label	lb.	.10⅝	@	.10⅞
blue label	lb.	.09⅝	@	.09⅞
red label	lb.	.08	@	.08½

Zinc Oxide—French Process

White seal	lb.	.11⅝	@	.11⅞
Green seal	lb.	.10⅝	@	.10⅞
Red seal	lb.	.09⅝	@	.09⅞

Yellows

Chrome	lb.	.17	@	.17½
Ocher, French medium	lb.	.02	@	.03
domestic	lb.	.01⅝	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate, lump	lb.	.07½	@	.07¾
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—

Blacks

Arrow "Aerfloted"	lb.	.07	@	.12
Bone Black	lb.	.07	@	.08½
Carbon, compressed	lb.	.06½	@	.12
Carbon, uncompressed	lb.	.06½	@	.11
Disperso, f.o.b. Louisiana	lb	.061	@	—
Disperso, f.o.b. Texas	lb.	.06	@	—
Drop Black	lb.	.06	@	.10
Excello, compressed	lb.	.06½	@	.12
Fumonex	lb.	.06	@	.09
Gastex, f.o.b. Texas	lb.	.04¼	@	.05½
Lamp Black	lb.	.12	@	.40
Micronex	lb.	.07	@	.12
Thermatomic-Thermax	lb.	.04	@	.07
Flex	lb.	.05	@	.08
P-33	lb.	.06	@	.09
United carbon, fob Tex.	lb.	.06	@	—
Velvetex carbon	lb.	.04½	@	.06
Blanc fixe dry f.o.b. works	ton	80.00	@	90.00
Carrara filler	lb.	.01¾	@	.02
Catalpo (fact.)	lb.	.02	@	—
Clay, China, domestic	ton	8.00	@	9.00
Aerfloted Suprex	ton	10.00	@	22.00
Congaree, c. l. f.o.b. mine	ton	9.00	@	—
Dark Blue Ridge	ton	9.00	@	20.00
Dixie	ton	15.00	@	29.00
Langford	ton	10.00	@	—
Lexington	ton	10.00	@	22.00
Mineral Flour, c. l. fob mine	ton	20.00	@	23.00
Par	ton	7.00	@	—
Tensulite		15.00	@	—
Glues, extra white	lb.	.22	@	.26
medium white	lb.	.20	@	.24
Magnesia, carbonate	lb.	.08¾	@	.11
Mica, white water grnd.	lb.	.06	@	.08
Off color (biotite)	lb.	.05	@	.07
Rotten Stone powdered)	lb.	.02	@	.05
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.92	@	4.12
Talc, domestic	ton	12.00	@	15.00
Pyrax A	ton	7.50	@	—
Whiting, commercial	cwt.	1.00	@	1.25
English cliffstone	cwt.	1.75	@	2.00
Quaker	ton	13.00	@	22.00
Superfine	ton	10.00	@	12.00
Sussex	ton	8.00	@	15.00
Witco	ton	20.00	@	—
Zinc Carbonate	lb.	.09½	@	.10½
Zinc Stearate	lb.	.23½	@	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Granulated M. R.	ton	30.00	@	45.00
Hard Hydrocarbon	ton	24.00	@	40.00
Paradura	ton	62.50	@	65.00
Pioneer, MR, solid	ton	40.00	@	42.00
Pioneer-granulated	ton	50.00	@	52.00
R & H Hydro-Carbon	ton	27.05	@	29.00
Robertson, MR, solid	ton	34.00	@	36.00
M.R. (gran)	ton	38.00	@	30.00

SOFTENERS

Acids

Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 66°	cwt.	1.60	@	1.95
Tartaric, crystals	lb.	.38	@	.38½

Acids, Fatty

Stearex	lb.	.15	@	.19
Stearic, double pressed	lb.	.17	@	.22

Alkalies

Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.40	@	

Oils

Corn, refined, bbls.	lb.	.09½	@	.10⅛
Cottonseed, crude		.07½	@	.09
Cycline	gal.	.27	@	.34
Degras (c.l. 100 bbls.)	lb.	.03¾	@	—
Less c. l. (10-25 bbls.)	lb.	.04	@	—
Lots less than 10 bbls.	lb.	.04¼	@	.04⅛
Fluxrite	lb.	.05½	@	.06½
Palm Lagos	lb.	.07⅝	@	—
Niger	lb.	.07½	@	—
Para-Flux	gal.	.17	@	—
Petrolatum, white	lb.	.08	@	.08½
Pigmentaroil	gal.	.21	@	.26
Pine, steam distilled	gal.	.65	@	.70
destructively distilled	gal.	.63	@	.64
Witco Palm Oil	lb.	.11	@	—
Witco Softener (f.o.b. works)	lb	.02	@	—

Resins and Pitches

Pitch, Burgundy	lb.	.06½	@	.07⅛
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	9.00	@	10.00
Rosin, grade K, 280 lb. bbl.		8.75	@	—
Pigmentar	lb.	.038	@	.0446
Tar Retort, 50 gal.	bbl.	13.50	@	15.00

Solvents

Acetone, pure	lb.	.12	@	.14
Alcohol denatured, No. 1 bbls.	gal.	.52	@	—
Benzol, 90%	gal.	.23	@	.25
Carbon bisulphide	lb.	.05½	@	.06¼
Carbon tetrachloride	lb.	.06¼	@	.07
Dryolene (f.o.b. Okla.)	gal.	.10	@	.10½
Motor gasoline, steel bbls.	gal.	.16	@	—
Naptha, solvent	gal.	.35	@	.40
Rub-Sol (f.o.b .Okla.)	gal.	.09	@	—
Turpentine, spirits	gal.	.53	@	.59
wood	gal.	—	@	.50
destructively distilled	gal.	.40	@	.43

Waxes

Beeswax, white	lb.	.51	@	.53
Carnauba	lb.	.35	@	.36
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.06½	@	.07
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30

Paraffin (c. l.—f.o.b. N. Y.)

Yellow crude scale	lb.	.03¾	@	
White crude scale 124/126	lb	.04	@	
Refined, 125/127	lb.	.05⅜	@	
Refined, 128/130	lb.	.05½	@	
Refined, 135/137	lb.	.07¾	@	
Refined, 138/140	lb.	.08¼	@	

ANTI-OXIDANTS

Agerite, Resin	lb.	.57	@	.62
Powder	lb.	.57	@	.62
White	lb.	1.10	@	1.20
Albasan	lb.	.70	@	.75
Antox	lb.			
Neozone	lb.			
Oxynone	lb.	.68	@	.80
Resistox	lb.	.54	@	.57
Stabilite	lb.	.57	@	.62
Stabilite Alba	lb.	.70	@	.75
VGB	lb.	.55	@	.66

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03¼	@	.03½
Sulfur flour, Refined, 100% pure (bags)	cwt.	2.40	@	2.75
Commercial (bags)	cwt.	1.75	@	2.10
Vandex	lb.	1.80	@	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THE year 1929 came to an end with many new records established by the rubber industry in the United States and throughout the world. More rubber was produced and absorbed by manufacturers than in any previous year. In the United States alone approximately 471,000 long tons were absorbed, as compared with 442,227 long tons in 1928 and with only 372,528 long tons in 1927.

Despite this heavy increase in domestic consumption, less tires were manufactured last year in the United States than during 1928. While it is true that more rubber was used per casing, the fact remains that the tremendous expansion took place in manufactured rubber products other than tires, tubes and tire sundries and repair materials.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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Just two examples will serve to show how this increase is taking form. In the first nine months of 1929, domestic factories produced 37,996,000 yards of rubber proofed fabrics as compared with only 28,744,000 yards in the same period of 1928. Also in the first nine months of 1929, mechanical goods shipments totaled $59,201,000, as against a total of $52,805,000 in the corresponding period of the previous year. The final questionnaire reports of the Rubber Manufacturers Association for the entire year will definitely show the extent of this expansion in miscellaneous rubber goods.

Figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,328	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,537	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,745,483	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,123,361	25.17	407,572
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	35,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,054,646	20.37	28,827
Sept.	39,235	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,805	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66				
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,938	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	19,761	31,136	30,137	33,702	41,594
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	44,780
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	47,521
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	49,233
June	31,713	24,272	22,753	35,822	28,598	33,801	37,676	43,227
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	41,526
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	38,274
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	34,707
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	34,800
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	27,659
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	

Figures on Quarterly Basis

Quarter	1922	1923	1924	1925	1926	1927	1928	1929
Jan./Mar.		96,776	87,509	95,263	94,301	99,216	103,558	128,565
Apr./June	127,360	89,498	75,674	104,099	87,109	103,242	108,500	129,981
July/Sept.		55,621	83,813	99,493	93,793	89,210	117,573	113,746
Oct./Dec.	155,067	63,617	92,656	85,789	83,212	80,860	117,597	
Totals	282,427	305,507	339,752	384,644	358,415	372,528	442,227	381,603

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Oct. 5	7,913	1,748	1,632	52	11,345
Oct. 12	6,639	1,216	1,462	65	9,382
Oct. 19	6,991	590	1,819	383	9,783
Oct. 26	6,194	1,406	1,558	242	9,400
Nov. 2	7,776	960	2,012	51	10,799
Nov. 9	7,103	648	1,470	106	9,327
Nov. 16	5,584	571	1,960	52	8,167
Nov. 23	6,109	919	1,711	78	8,817
Nov. 30	6,672	1,404	2,205	9	10,290
Dec. 7	8,543	1,920	2,115	16	12,594
Dec. 14	7,428	1,299	1,655	6	10,388
Dec. 21	7,599	1,953	2,003	22	11,577
Dec. 28	4,943	364	1,856	5	7,168

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—New York Market in Cents per Pound

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1927																																
July	85½	—	—	—	85½	84⅝	84⅞	84¾	84¾	—	84¼	84½	84½	84½	84½	85	—	85⅛	85	85	85½	85½	—	85	85	85	84¾	—	85	—	84⅞
August	85½	85½	85¼	85¾	85½	85½	85⅝	85⅝	85⅝	85¾	85⅝	86	85½	85½	85½	85½	85⅛	85½	85¼	85¼	85½	85½	—	84¼	84¼	84¼	84¼	84	84	—	85⅛
Sept.	83⅝	83⅝	—	—	83⅞	83⅞	83⅝	83⅝	83⅝	83⅜	—	83⅛	84	84	84	84	84	83¾	83¾	83½	83¾	83¾	84	83½	83½	84	84	84	83¾	83¾	83⅝
Oct.	85	—	83¼	83½	83⅝	83⅞	83⅞	83⅞	—	83⅞	84⅛	84¼	84¼	84¼	84¼	84¼	84¼	84½	84⅝	84⅝	84⅝	84⅝	85	85	85	85	85	85¼	85¼	85¼	84⅝
Nov.	85	85½	85⅝	86⅛	—	86⅝	86⅝	—	87	86⅝	86¼	—	86¼	86½	87⅛	87⅜	87⅛	87⅛	87⅛	87⅛	88¼	88⅞	39½	40	40½	40½	41½	41½	41½	41½	41½	87½
Dec.	85	40½	40⅜	40⅝	—	40¾	40½	40	40	40½	—	40¾	40¾	40	39¾	40	—	40⅝	40⅝	40⅝	40½	40¾	41	41	—	—	41½	41⅝	41¾	41⅝	41⅝	40⅝
1928																																
January	—	—	41¾	41¾	41¾	41	—	86⅜	86¾	—	40¾	40⅝	—	40½	—	40¼	40⅛	40⅛	40⅛	40¼	40¼	40¼	40½	40⅞	40⅞	39⅝	39¾	39¾	—	39	38⅝	40¼
February	87½	87¾	87¾	87¾	—	86¾	87	—	85¾	33⅞	33⅞	—	—	24¼	25¼	25¼	25¼	25¼	28⅜	28¾	28½	28½	28½	28½	28½	28½	29	28⅝	—	—	—	82¾
March	29	28⅝	28⅜	—	29	28⅝	26¾	—	25½	25¾	25¾	24¾	24¾	24¾	25½	25	25¼	17⅞	17⅞	26¾	26¾	26¼	—	27½	27½	27½	27¼	27¼	27⅜	27⅜	27⅜	26½
April	—	27¾	27¾	21¼	—	—	—	—	20	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	17⅝	17⅝	17⅝	17⅝	17⅝	17⅝	17⅝	17	17	17	17⅝	17⅝	17⅝	17⅝	17⅝	—	19
May	17½	17⅝	18⅛	19¼	—	18⅝	19¼	19⅛	18⅝	—	19¼	18⅞	18⅞	19	19	19	18⅝	18¾	18½	19⅜	19⅜	19⅜	19	19¼	19¼	19¼	19¼	20¼	—	—	19¼	19
June	19¾	19¾	—	19¾	—	—	—	19¾	19¾	—	19½	19⅜	19½	19⅜	19⅜	—	—	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	20	19¼	—	19½
July	—	18⅝	18⅜	—	19	19	19	—	19¼	19¼	19½	19⅜	19⅝	19⅝	—	19⅝	19½	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19	19¼	19⅝	19½
August	19½	19½	19¾	19¾	—	19⅝	19⅝	20	20	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19½	18½	18½	18⅝	19⅝	19⅝	19	19⅝	19⅝	19⅝	19⅝	19⅝	19	19	19	18½
September	—	—	—	—	—	18⅝	18⅝	—	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	19¼	19¼	19⅛	18½	18½	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18½
October	18⅝	18½	18½	18⅝	—	18⅝	18⅝	—	18⅝	17⅝	18⅛	—	18⅝	18⅝	18⅝	18⅝	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	18⅝	18⅛
November	18⅜	18⅞	18⅜	—	—	18⅝	18⅝	—	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝
December	17⅜	—	17⅜	17⅜	17⅜	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛
1929																																
January	—	22⅝	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18⅝	18⅝	20	20	20	19⅝	20⅝	20¼	20¼	20¼	—	20⅝	20½	21	21¼	21¼	21¼	21¼	21¼	21¼	21¼	21¼	20¼
February	22	22	21¾	21¾	22¼	22¼	22¼	22¼	22¼	—	—	—	22⅝	23	25⅝	25⅝	25⅝	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	24
March	26	26	26	26	26	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24½
April	23	23¼	22¼	22⅝	22½	22½	22⅝	22⅝	22½	22½	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝
May	19¾	19¾	19¾	19¾	—	20¾	20¾	21¾	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21¼	21¼
June	21⅞	21⅞	21⅞	21¾	21¾	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞
July	20¾	21¼	21	—	21¼	21¼	21	21	22½	22	22	22	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝	21⅝
Aug.	21	21	21	—	21	21	21	21	21	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Sept.	21⅜	—	—	20¼	20¼	20¼	20¼	20¼	20¼	20⅝	20⅝	20⅝	20⅝	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼
Oct.	19½	19½	19½	19½	19¾	19¾	20¼	20¼	20¼	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Nov.	17⅞	17⅞	17⅞	17½	17½	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
Dec.	—	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾
1930																																
January	—	15⅞	15⅝	15⅝	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.35	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97
Mar.	14.58	34.21	22.83	41.00	59.00	41.04	26.82	24.55
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.80
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.89
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.
1	9¾	8⅞	—	—	17	9¾	—	8	—
2	9½	8⅝	8	7⅞	18	9¾	8⅛	8	—
3	9⅝	—	7⅞	7¾	19	9¾	8	7⅞	—
4	9½	8½	8	7¾	20	—	8¼	7⅞	—
5	9¾	8½	8	—	21	9¾	8¼	7⅞	—
6	—	8⅝	8	—	22	9⅝	8⅛	—	—
7	9¾	8¼	8	—	23	9⅝	8⅛	7¾	—
8	10	8¼	—	—	24	9⅝	—	7¾	—
9	10	8⅛	8	—	25	9⅛	8⅛	—	—
10	9⅞	—	8	—	26	9⅛	8¼	—	—
11	9⅞	8⅛	8⅛	—	27	—	8⅛	7⅞	—
12	10	7⅞	8	—	28	9⅛	8	7⅞	—
13	—	7⅞	8	—	29	9	8	—	—
14	10	8⅝	8	—	30	9⅛	8	8	—
15	10	8⅝	—	—	31	9⅛	—	8	—
16	9⅞	8⅛	8	—					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	10.505
Feb.	19.021	15.713	11.875	Sept.	16.293	8.530	10.160
Mar.	20.125	12.736	12.135	Oct.	16.366	8.807	9.620
Apr.	19.897	8.864	10.490	Nov.	18.159	8.596	8.442
May	19.769	8.845	10.717	Dec.	19.690	8.570	7.958
June	17.880	9.293	10.580	Average			
July	16.770	9.312	11.065	for Year	18,375	10,656	10,291

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Dec.	Jan.	Day of Month	Dec.	Jan.	Day of Month	Dec.	Jan.
1	——	——	11	17.30	——	21	17.25	——
2	17.30	17.45	12	17.25	——	22	——	——
3	17.55	17.30	13	17.25	——	23	17.25	——
4	17.55	17.15	14	17.20	——	24	17.25	——
5	17.35	——	15	——	——	25	——	——
6	17.50	——	16	17.00	——	26	17.40	——
7	17.40	——	17	17.05	——	27	17.40	——
8	——	——	18	17.15	——	28	17.30	——
9	17.20	——	19	17.20	——	29	——	——
10	17.35	——	20	17.00	——	30	17.30	——
						31	17.25	——

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	18.62
Feb.	14.10	18.40	20.21	Sept.	21.95	18.67	18.33
Mar.	14.32	19.38	20.19	Oct.	20.22	19.62	18.46
Apr.	14.75	20.63	20.29	Nov.	20.22	19.84	17.58
May	16.07	21.58	19.41	Dec.	19.58	20.22	17.28
June	16.85	21.50	18.74	Average			
July	18.00	21.36	18.62	for Year	17.49	19.97	19.03

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955	90,058	42,166	43,316	63,825	133,352	152,271	153,883
March	85,740	114,061	100,536	49,600	39,324	56,476	135,340	153,385	157,012
April	92,757	113,083	107,659	38,963	33,986	55,409	131,720	147,069	163,068
May	94,568	105,356	97,192	44,181	34,374	55,404	138,744	139,730	152,596
June	89,250	90,198	92,061	47,233	40,001	46,035	136,483	130,119	138,096
July	98,469	93,242	92,535	40,687	42,304	38,858	139,056	125,546	134,393
Aug.	96,148	68,994	90,769	40,937	51,875	41,618	137,085	120,869	132,387
Sept.	97,829	68,851	84,362	37,966	48,566	49,480	135,793	117,417	133,842
Oct.	97,452	66,421	88,483	42,804	41,571	62,294	140,256	107,992	150,777
Nov.	101,034	61,956	92,219	37,076	68,119	62,358	138,110	130,075	154,577
Dec.	100,130	66,166		47,938	68,764		148,068	134,930	

(Rubber Manufacturers' Association figures raised to 100%.)

Stock of Crude Rubber in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1927	1928	1929	At end of	1927	1928	1929
Jan.	54,994	66,524	25,191	July	63,717	35,429	30,080
Feb.	58,826	62,964	25,554	Aug.	64,491	32,084	35,605
Mar.	63,055	58,272	28,214	Sept.	68,236	31,440	42,188
Apr.	66,897	53,425	31,368	Oct.	69,569	24,207	
May	67,169	44,628	31,290	Nov.	67,050	17,775	
June	63,902	38,756	31,025	Dec.	63,793	19,815	

At End of Recent Weeks
Stocks in London

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1929					
January	21,953	23,016	23,547	24,423	
February	25,389	25,413	24,757	25,005	
March	25,441	25,920	26,442	27,656	28,077
April	28,984	30,446	30,503	31,215	
May	31,580	31,127	30,955	30,893	
June	31,539	31,635	31,127	30,617	30,982
July	29,996	30,661	30,790	30,167	
August	30,937	31,444	33,573	34,651	35,605
September	36,620	37,901	40,151	42,077	
October	43,478	44,339	45,711	46,819	
November	48,092	49,302	50,068	51,012	52,538
December	53,431	53,180	53,894	54,260	

Stocks in Liverpool

1929					
January	2,953	3,520	3,505	3,824	
February	3,860	4,106	4,086	4,151	
March	4,255	4,136	4,100	4,333	4,433
April	4,442	4,591	4,521	4,779	
May	4,614	4,384	4,216	4,665	
June	4,642	4,750	4,733	4,515	4,628
July	4,393	4,547	4,757	4,739	
August	4,662	4,481	5,993	7,285	7,560
September	8,351	8,660	9,780	10,161	
October	10,795	11,571	11,788	12,665	
November	14,272	16,158	17,543	17,479	17,752
December	17,922	18,263	18,696	19,059	

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1927	1928	1929	End of	1927	1928	1929
Jan.	25,440	25,868	29,617	July	22,558	18,663	33,859
Feb.	26,766	22,867	32,373	Aug.	25,764	18,971	30,334
Mar.	27,344	20,538	29,437	Sept.	25,178	14,398	32,138
Apr.	24,543	16,946	26,474	Oct.	25,790	12,149	33,770
May	25,133	17,437	30,764	Nov.	28,369	29,188	30,963
June	21,898	18,207	30,403	Dec.	25,798	32,895	

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	9.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1925	26,001,664	66.2	1928	24,247,282	81.6
1929					
January	1,835,207	79.4	July	1,896,666	78.2
February	2,265,024	80.2	August	1,570,099	79.4
March	2,613,389	80.4	September	2,110,003	80.7
April	2,729,899	81.3	October	1,647,350	76.4
May	2,574,224	76.5	November	596,989	64.7
June	2,184,219	75.2	December		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1928	1929	MONTHS	1928	1929
January	20,938,000	22,602,000	July	30,960,000	36,860,000
February	21,136,000	22,776,000	August	33,148,000	37,759,000
March	24,041,000	28,495,000	September	29,691,000	34,193,000
April	25,712,000	32,019,000	October	30,610,000	32,816,000
May	27,355,000	34,117,000	November	26,222,000	31,502,000
June	29,022,000	33,163,000	December	26,644,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	4,965	5,358	6,722	4,932	5,394	6,626	10,432	9,949	13,712
Feb.	5,095	6,363	6,912	4,458	5,031	5,282	11,075	11,721	15,495
Mar.	6,276	6,819	7,519	5,701	5,731	6,708	11,668	12,880	16,351
Apr.	6,299	6,178	7,884	5,701	5,812	7,294	12,122	12,71.	16,929
May	6,151	6,759	8,145	5,657	6,457	7,184	12,462	13,024	17,849
June	6,202	6,692	7,304	6,253	7,117	7,254	12,462	12,162	17,957
July	5,087	6,498	6,475	5,973	7,895	7,855	11,326	11,157	15,830
Aug.	5,752	7,469	5,806	6,393	8,403	7,845	10,721	10,034	14,226
Sept.	4,822	6,802	4,758	5,717	7,145	5,998	9,722	9,765	12,875
Oct.	4,773	7,326	4,919	4,799	5,717	4,960	9,665	11,520	12,845
Nov.	4,502	6,075		4,306	4,998		10,136	12,579	
Dec.	4,497	5,605		4,165	4,591		10,264	13,624	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	5,337	5,441	6,517	6,016	6,072	7,242	15,585	12,982	15,386
Feb.	5,658	6,895	6,769	5,120	5,431	5,278	16,075	14,650	16,999
Mar.	7,184	6,231	7,466	6,157	5,731	6,737	17,096	15,573	17,750
Apr.	7,373	6,661	7,634	6,359	5,702	7,164	17,801	16,638	18,134
May	6,737	7,168	7,660	6,140	6,300	7,038	18,389	17,702	18,928
June	6,306	6,953	6,978	6,832	7,136	6,950	17,858	17,159	18,741
July	5,284	6,674	6,178	7,070	8,729	8,113	16,004	14,974	16,832
Aug.	6,480	8,343	5,846	7,983	9,350	8,183	14,664	13,931	14,157
Sept.	5,651	7,103	5,536	6,758	7,154	6,250	13,511	13,543	13,424
Oct.	5,065	6,929	5,310	5,024	5,662	5,001	13,539	15,285	13,656
Nov.	4,775	5,592		4,723	5,002		13,585	15,743	
Dec.	4,969	5,184		4,712	4,858		13,692	16,117	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	455,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	282,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	237,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	28,486	2,801	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,441	170,928	46,513				
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[1]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,958
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,277	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1927:															
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,830	1,605	842	581	525	4,851	7,988	11,774	1,100	2,273	1,026	47,565
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,869
Mar.	27,879	10,508	17,371	3,688	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,499
Apr.	20,139	9,335	10,804	3,233	789	630	494	258	3,993	5,040	5,499	736	1,014	1,228	33,810
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,355	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	969	40,788
July	30,481	13,383	17,098	5,129	1,043	905	598	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	988	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	75,962
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	650	1,922	733	66,824
June	40,398	14,344	26,054	5,563	1,122	1,061	547	422	5,582	6,693	11,270	608	1,398	543	60,868
July	46,454	15,071	31,383	5,457	974	1,247	500*	462	6,422	7,192	13,995	555	1,457	543	70,187*
Aug.	50,441	15,469	34,972	6,079	685	993	500*	431	4,644	7,298	10,782	545	1,563	499	68,991*
Sept.	53,484	12,392	41,092	7,993	384	832	500*	406	4,708	7,517	10,149	755	1,566	504	76,406*
Oct.	47,937	12,516	35,421	8,411	812	1,047	500*	485	4,697	8,295	10,512	893	1,606	445	73,124*
Nov.	46,279	11,204	35,075	7,195								771	1,442		
Dec.	48,513	13,451	35,062												

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included— such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Austra-lia (ed)	Belgium (d)	Nether-lands	Scandi-navia (abcdf)	Spain (g)	Czecho-slovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,128	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,718	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,648	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,649
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,133	596,695
1927:															
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,361	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,313
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,114	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	537	544	31	337	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,331	5,179	5,001	4,613	2,905	2,727	1,259	684	1,131	627	113	226	115	356	86,275
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	996	1,437	854	201	468	37	277	71,233
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	695	2,215	672	687	507	24	420	65,737
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023	700*	2,918	1,039	253	519	30	465	67,845*
Aug.	35,207	14,594	4,645	4,082	2,879	3,663	908	700*	724	902	254	429	25	319	69,331*
Sept.	32,171	17,010	3,889	4,691	1,908	3,511	1,224	700*	853	672	253	361	50*	477	67,770*
Oct.	35,840	16,111		3,355	1,821		1,838				278				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 743 tons in the first 8 months of 1929. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$45,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1928:				
January	2,177,000	17,682,000	3,431,000	$5,630,000
February	2,575,000	19,181,000	3,628,000	5,838,000
March	2,853,000	22,583,000	3,747,000	6,675,000
April	2,416,000	18,575,000	2,928,000	5,406,000
May	2,744,000	21,597,000	3,519,000	6,274,000
June	2,953,000	18,763,000	3,321,000	6,126,000
July	3,447,000	17,630,000	3,168,000	5,157,000
August	4,613,000	21,289,000	3,461,000	6,306,000
September	4,966,000	21,451,000	2,725,000	5,393,000
October	5,914,000	21,932,000	2,297,000	5,827,000
November	4,173,000	18,686,000	2,649,000	5,201,000
December	2,348,000	15,811,000	2,771,000	5,271,000
1929:				
January	2,828,000	19,975,000	3,876,000	6,033,000
February	3,095,000	18,979,000	2,869,000	6,135,000
March	3,952,000	17,226,000	2,746,000	7,013,000
April	4,000,000	17,256,000	2,601,000	7,035,000
May	4,860,000	19,541,000	2,916,000	7,189,000
June	4,409,000	20,007,000	2,502,000	6,792,000
July	4,260,000	19,315,000	1,295,000	6,306,000
August	5,085,000	23,095,000	2,948,000	6,792,000
September	5,507,000	21,702,000	2,841,000	5,906,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Gutta Percha Tons	Gutta Percha Dollars
1919	1,430	760,690	727	937,088	8,382	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	851,393	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	896,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	2,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:	3,075	1,755,685	731	430,355	7,552	2,540,059	1,597	777,128
July	191	100,842	123	46,747	378	113,295	81	27,344
Aug.	—	——	399	165,460	451	126,962	147	60,738
Sept.	—	——	60	38,198	2,028	713,736	125	56,768
Oct.	—	——	121	59,358	429	129,065	239	94,570
Nov.	—	——	59	41,119	472	140,116	88	35,409
Dec.	—	——	83	58,311	522	156,154	145	59,911
1929:								
Jan.	—	——	46	30,374	484	152,260	138	62,950
Feb.	—	——	82	70,209	823	255,594	40	19,806
Mar.	—	——	90	75,444	428	122,026	1	1,140
Apr.	83	38,241	163	93,240	1,086	315,621	1	1,086
May	125	57,260	70	67,891	752	212,400	76	24,053
June	145	62,808	31	26,038	802	248,143	77	25,612
July	200	86,175	49	46,440	572	180,065	14	5,807
Aug	190	80,443	58	47,769	575	171,733	—	——
Sept.	107	51,156	38	30,327	913	279,225	—	——
Oct.	200	79,968	58	43,756	636	181,421	—	——
Nov.	125	47,796	13	11,600	583	182,677	49	14,935

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Consumption Production	Consumption Tons	Consumption % to Crude	Stocks*	Year	Consumption Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,366	73,535	36.3	.....	1924	80,079	76,072	22.4	.....
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1927:									
Jan.	16,526	12,374	39.3	25,903	July	15,488	13,842	47.4	26,599
Feb.	15,860	14,424	47.8	27,291	Aug.	15,109	15,836	47.3	25,157
Mar.	16,788	13,528	37.4	27,124	Sept.	14,392	14,790	54.3	23,429
Apr.	14,483	16,677	46.5	25,712	Oct.	16,127	17,292	64.5	22,176
May	16,159	15,754	46.1	26,419	Nov.	15,477	14,876	55.5	21,728
June	16,652	15,547	46.0	25,811	Dec.	16,083	13,431	52.7	24,980
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,848	Aug.	19,049	17,890	41.7	15,881
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,283	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,137	Nov.	18,245	18,880	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,286	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.	18,865	18,744	53.8	25,117
May	20,385	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,980	Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927 and 9,577 tons in 1928.

REVIEW DESK

Books, New Publications, Catalogues, Etc.

La Durezza Brinell per i Metalli, per la Gomma e per l'Ebanite. By Raffaele Ariano. Published by the Societa Editrice Unitas, Milan, Italy. 1929. 48 pp.

This comparison of the Brinell method for the testing of the hardness of various substances with other methods is a reprint from the review *L'Industria.*

Sui Coefficienti d'Attrito fra Gomma e Vari Materiali. By Raffaele Ariano. Published by the Casa Editrice Francesco Vallardi, Milan, Italy. 1929. 24 pp.

This paper on the coefficients of friction of rubber and other materials is a reprint of an article by the author in *Politecnico.* An appendix treats of the work on pneumatic tires done at Iowa State College in 1924.

Chemicals for the Rubber Industry: Thionex. Published by E. I. du Pont de Nemours & Company, Wilmington, Del. 1929. 36 pp. For free distribution.

The trend to low temperature cures in the rubber industry has been due largely to the development of adequate accelerators for this purpose. Thionex, which is tetramethylthiurammonosulfide purified by crystallization from alcohol, dried and finely ground, is such an accelerator and is described in this booklet with formulas and analyses of tests in connection with various rubber products.

Twenty-Ninth Year Book. Published by the Rubber Manufacturers Association, Inc., 250 West 57th Street, New York City. 1929. 32 pp.

Shortened by the elimination of the organization's constitution and by-laws, the list of past officers and other data, the latest edition of this year book is devoted entirely to a record of the present membership, committees, officers and a 1928-29 necrology. This is the first year book published by the association under its present name, following the reorganization last year.

Native Rubber in the Dutch East Indies. By V. A. Tayler and John Stephens. Published by the Rubber Growers' Association, Inc., 2 Idol Lane, Eastcheap, London, E. C. 3, England. 1929. 48 pp. 1s.

The details of this report have already been described on page 330 of the December 25 issue of The Rubber Age. The volume itself is attractively prepared with thirty interesting illustrations. One conclusion of the authors is that the only quick method by which the planted areas of rubber could be fairly correctly determined is by an aerial survey.

Sharing Profits with Employees. Published by the Policyholders Service Bureau of the Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. 1929. For free distribution.

Profit sharing as an important phase of industrial relations was practiced in France as early as 1842. Thirty years later the first English plan was organized, and shortly afterward attempts at profit sharing were made in the United States. From the best practices of more than eighty companies in the United States, Canada and England, the data for this report has been drawn and is presented in compact form.

The Five-Day Week in Manufacturing Industries. Published by the National Industrial Conference Board, Inc., 247 Park Avenue, New York City. 1929. 80 pp. $1.50.

Practical experiences of manufacturers with the five-day week program are described in this volume, together with the extent of its use, the technique of its operation and the judgment of business executives as to its effects. Among others now using this shortened working week are the Portland Rubber Company, Portland, Ore., and the rubber divisions of the Eberhard Faber Pencil Company at Newark, N. J., and of Jenkins Brothers at Elizabeth, N. J.

The Soviet Union Looks Ahead. Published by Horace Liveright, 61 West 48th Street, New York City. 1929. 286 pp.

Within the next five years, the Soviet Union proposes to spend $33,000,000,000 on industrial development, and it is the purpose of this volume to tell the American public how that sum will be used for the construction of railroads, factories, power plants, mines, public buildings and dwellings. Whereas Russia produced 65,100 tires in the fiscal year 1927-28, it is estimated under this five-year plan for economic construction that 460,000 will be produced in 1932-33. Rubber shoe production totaled 36,900,000 pairs in 1927-28 and is estimated at 65,000,000 pairs for 1932-33.